



VOL. XXX.

CLEVELAND, O., SEPT. 1, 1904.

No. 9.

### OUR MAGNIFICENT COASTWISE FLEET.

If it were not for the magnificent coastwise fleet the documented tonnage of the United States would cut a most pitiable figure. It is, however, over 6,000,000 gross tons register and is exceeded only by the merchant marine of Great Britain. The shipping of Great Britain, however, is principally employed in the development of foreign trade while the shipping of the United States is almost wholly a part of the domestic transportation system. An analysis of the figures shows that the tonnage in the coasting trade has been steadily increasing. During the past ten years it has increased 1,286,344 tons, or to put it in another way, it has grown from 3,854,693 tons in 1893 to 5,141,037 tons in 1903. Indeed the entire increase in American shipping during the past decade has been employed exclusively in the coastwise service as is shown by the fact that during these ten years the amount of tonnage employed in the foreign trade has actually decreased 3,935 tons. In other words while the tonnage engaged in the foreign trade was 883,199 tons in 1893 it has declined to 879,264 in 1903.

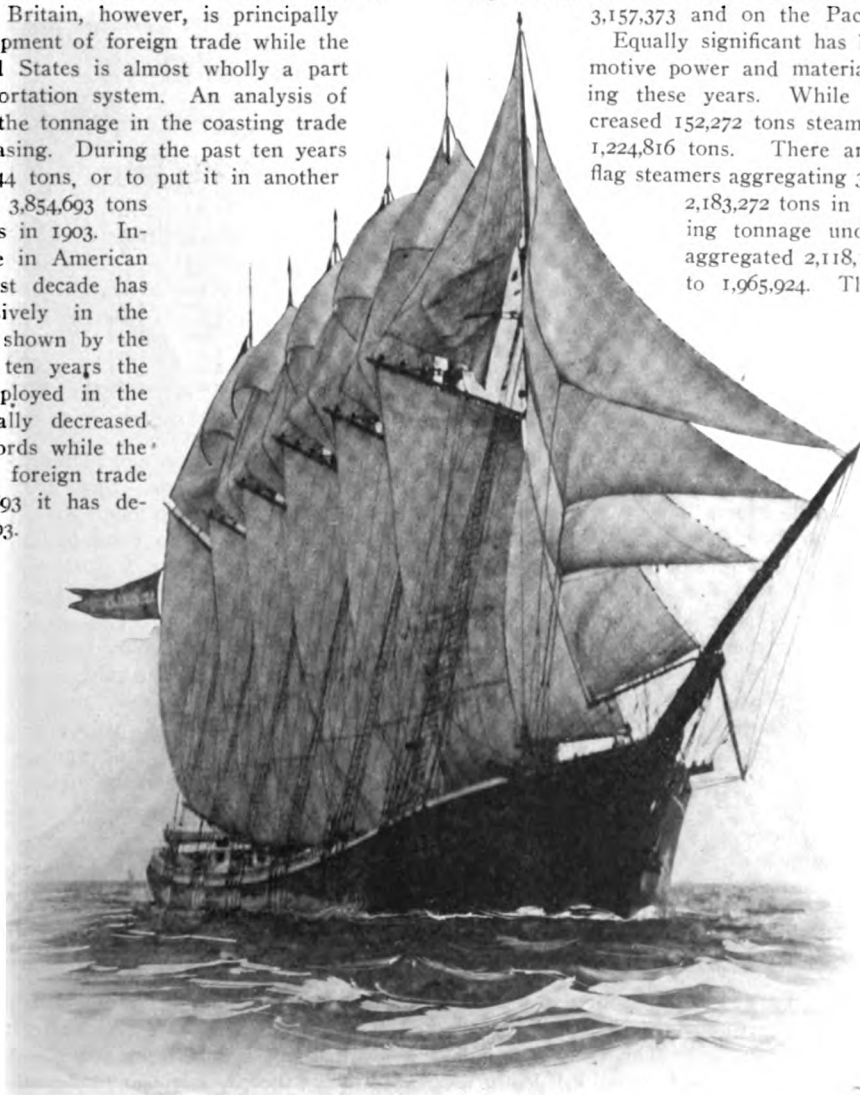
It is shown that the great increase in tonnage for the coastwise service has been on the great lakes during the past ten years while the tonnage employed in river service has during these years sadly declined. In 1893 the tonnage of vessels employed in great lakes trade amounted to 1,261,067 tons and is now 1,002,698 tons, or an increase in ten years of 641,631 tons.

River tonnage during this decade has declined 83,797 tons,

the figures being 298,892 tons for 1893 and 215,095 tons for 1903. During the decade there were added to the Atlantic fleet vessels aggregating in tonnage 349,683 and to the Pacific fleet vessels aggregating in tonnage 354,757. The tonnage flying the American flag on the Atlantic coast now is 3,157,373 and on the Pacific coast 812,179.

Equally significant has been the change in the motive power and material of construction during these years. While sail tonnage has decreased 152,272 tons steam tonnage has increased 1,224,816 tons. There are flying the American flag steamers aggregating 3,408,088 tons as against 2,183,272 tons in 1893. In 1893 the sailing tonnage under the American flag aggregated 2,118,196 and has now fallen to 1,965,924. The wastage of wooden

vessels too during these past ten years has been drastic, for notwithstanding a considerable wooden construction during the decade the total is 282,437 tons less than it was in 1893. The figures are 3,647,098 tons in 1903 as against 3,929,535 tons in 1893. On the other hand iron and steel tonnage has increased during the decade by the substantial figure of 1,544,711 tons. The tonnage of iron and steel under the American flag is now 2,440,247 tons as against 895,536 in 1893. This great increase in steel tonnage is due to the phe-



SIX-MASTED SCHOONER ADDIE M. LAWRENCE OF THE WINSLOW FLEET.

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nomenal multiplication of steel steamers on the great lakes during the past ten years.

During the decade the fisheries fleet, which may be regarded as a part of the coastwise system, has fallen off from 87,179 tons to 67,044 tons, a loss of 20,135.

The splendid growth in tonnage credited to the coastwise trade during the past three or four years has been directly due to the stimulation afforded by legislation growing out of the changed relations of the United States, Hawaii, Porto Rico and the Philippines. Were it possible to add Cuba to this catalogue the tonnage would show an even greater increase, but through a lack of foresight the trade between this island and the United States was not reserved to the American ship when the reciprocity treaty was framed with that country. The hope of legislation favorable to the merchant marine in the foreign trade also stimulated the construction of ships somewhat three years ago, but the promises advanced at that time were never fulfilled. The Philippines are to be included in the coasting service after July 1, 1906, and it is quite likely that some new construction will be undertaken for this trade. The United States too has during the present year purchased the strip of land across the Isthmus of Panama for the construction of an Isthmian canal and has assumed governmental authority over this zone, even

### MORSE IRON WORKS REORGANIZED.

The Morse Iron Works, Brooklyn, N. Y., has been succeeded by a new company to be known as the Morse Dry Dock & Repair Co. The original company was forced into bankruptcy by the continued exactions of labor unions, followed by a series of strikes. The business has always been a profitable one but was lately so interfered with by walking delegates that it was found impossible to operate the plant. Petitions to have the company adjudged a bankrupt were filed in the United States district court in October last and for several days the plant was closed. It was later reopened by the order of the court and has been operated since that time by Henry H. Petze, the trustee elected by the creditors. The resumption of work is a good thing for Brooklyn as the Morse plant frequently employed as many as 2,000 hands. The price paid for the plant was \$50,000 over and above the mortgage which amounted to \$505,000.

### PLANS FOR IMPROVED BATTLESHIPS.

The chief constructor of the navy has before him two sets of plans for improved battleships. Each contemplates the heaviest guns for the main batteries and the exclusion of guns of medium calibre. One plan provides for four 12-in. guns

VESSELS IN COASTING AND FISHERIES TRADE.

Year.	Coasting trade.						Whale fisheries.		Cod and Mackerel fisheries.		Total merchant marine exclusive of foreign trade.	
	Enrolled vessels.		Licensed vessels under 20 tons.		Total.		Total.		Total.			
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
1789		68,607				68,607				9,062		77,669
1790		220,904		25,736		246,640		5,647		29,979		282,266
1800		371,501		33,662		405,163		3,777		84,487		443,397
1810		523,556		47,502		571,058		32,386		76,078		679,322
1820		490,468		18,390		508,858		57,284		101,797		667,939
1830		1,120,311		33,241		1,153,552		132,285		108,242		1,394,079
1840		1,731,411		38,965		1,770,376		180,186		124,698		2,075,260
1850		2,439,320		41,609		2,480,929		185,728		156,707		2,823,364
1860	18,630	2,470,928	3,853	44,587	22,492	2,515,515	311	70,202	1,714	62,704	24,517	2,648,421
1870	15,286	2,545,059	4,763	58,123	20,049	2,598,182	185	40,028	2,445	79,885	22,679	2,718,095
1880	14,221	3,133,812	6,180	77,604	20,401	3,211,416	88	21,976	1,541	74,464	22,080	3,307,856
1890	12,961	3,878,397	7,019	86,916	19,980	3,965,313	48	11,017	1,417	50,679	21,445	4,027,009
1900	13,241	4,195,875	7,327	90,641	20,568	4,286,516	42	9,899	1,435	51,629	22,045	4,348,044
1901	13,632	4,488,421	7,637	94,224	21,269	4,582,645	41	9,534	1,461	52,444	22,771	4,644,623
1902	13,643	4,761,888	7,873	96,826	21,516	4,858,714	36	9,320	1,511	56,633	23,083	4,924,667
1903	13,690	5,041,533	8,086	99,504	21,746	5,141,037	36	9,512	1,509	57,532	23,291	5,208,081

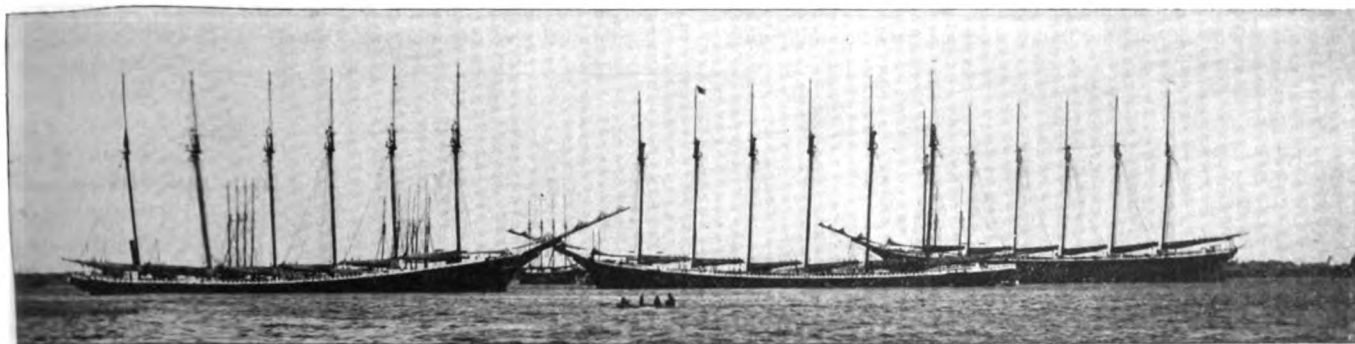
to the extent of assessing customs duty upon all goods entering the zone from any country other than the United States. It would naturally follow, therefore, that any shipments originating in this country for the zone would be transported there in American bottoms and this question is now before the bureau of navigation for decision. If the trade to the zone is reserved to American ships it will go a long ways towards stimulating coastwise business and making the employment of vessels in that service extremely profitable. As a natural result orders for ships will follow.

The wisdom of reserving the internal trade of the United States to American ships is borne out by the mere figures of the growth of the coastwise tonnage which are given in the accompanying table. This record is a concrete fact, the eloquence of which cannot be disputed. Every ton of this tonnage means that from \$30 to \$45 has been spent in an American ship yard. If the same policy of protection were pursued towards vessels employed in the foreign trade undoubtedly the same story could be told for that trade.

Work has been started on a new steamer for the ordnance department United States government at the yards of the Pinsey & Jones Co., Wilmington, Del. The steamer will be 126 ft. long, 26 ft. beam and 13 ft. 10 in. moulded depth. A speed of 13.5 miles an hour for four successive hours will be required and the vessel must be completed within six months.

and eight 10-in. guns, and nothing between those calibres and guns of the 3-in. type. Such a ship is estimated to have a displacement of 16,000 tons. Another plan provides for twelve 12-in. guns, giving a main battery of the most formidable type yet designed for a battleship. The problem presented by such a heavy battery is in the increased displacement, it being estimated that a vessel so heavily armed would displace not less than 20,000 tons. There would be on such a ship no guns of medium calibre and consequently no need of a superstructure. The 3-in. guns and the 12-pounders would be sufficient to repel torpedo attack. In both cases it would be necessary to protect the smokestacks and the engine room hatches with heavy armor.

A decision which is important to all cities with harbors was lately rendered in the Richmond circuit court by Judge Scott. He decided the suit of Richmond against Peter Hagan in favor of the city, which demanded \$442.74 for expenses incurred in clearing the harbor of the wreckage of a coal barge owned by Peter Hagan & Co., Philadelphia, which sank there on July 3, 1898. Mr. Hagan did not remove the wreck, as he had agreed to do, and after the interval of a year the barge sank out of sight and the James river committee instructed the city engineer to clear the harbor of the dangerous obstruction, which he did at an expense of \$442.74. The city sued Hagan for this sum.



THERE ARE ONLY THREE SIX-MASTED SCHOONERS IN THE WORLD HERE THEY ARE ALL AT ANCHOR IN PORTLAND HARBOR.

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## Portland, Me., and Her Coastwise Trade.

By MAURICE C. RICH.

*Secretary Portland Merchants' Exchange.*



Since the early days when Portland was noted the world over for its large commercial relations with the West Indies it has become far better known as a trans-Atlantic port rather than for its coastwise shipping. In the early fifties we were one of the foremost Atlantic ports doing business with the Indies.

Then it was that our harbor was a hive of industry. Molasses and coarse sugar were brought here in hogsheads and boxes while hoops and shooks cut from Maine forests made up the return cargoes. The wood has now been cut, sugar comes in bags and steamers bring most of the molasses in bulk to the larger distributing centers.

Although Portland has lost this branch of her commerce, her magnificent maritime facilities have not been allowed to lay dormant. Recognized the world over as the most accessible harbor on the Atlantic seaboard at all seasons, Portland naturally became the chief entry port of Canada, for about half of the year, or while the ports of that Dominion are sealed

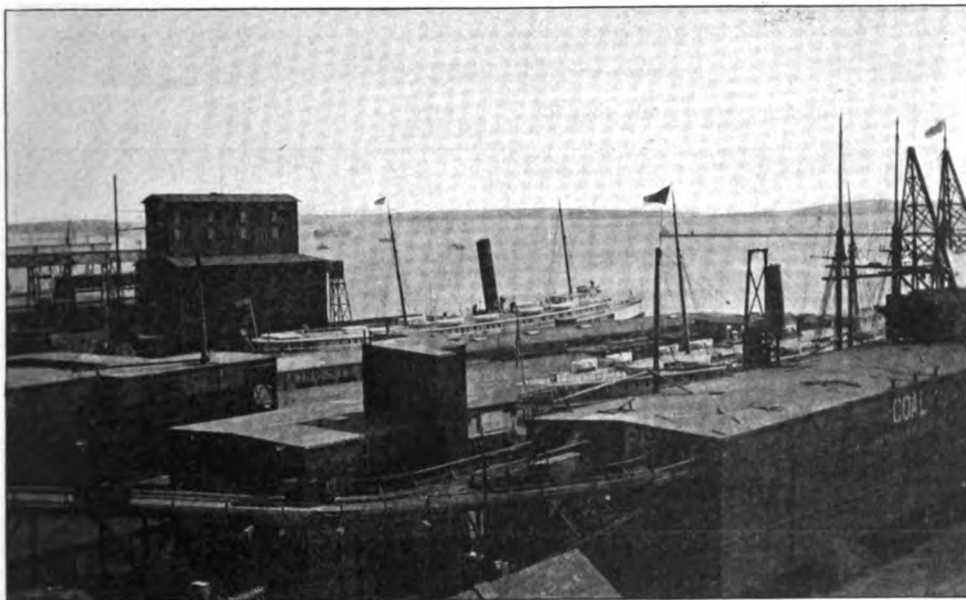
or obstructed by ice; and from a comparatively small beginning in this direction Portland fast assumed her present position of the large trans-Atlantic shipping port, and in this respect there has been a great advance within the past few years,

this having now become an all-the-year-around trans-Atlantic shipping port.

Then, too, the lumber export business of this city has greatly revived within the past few years, shipments now being made to many South American ports. A great deal of lumber from Canada is brought here in bond for export, coming chiefly from tracts controlled by Portland investors and lumber operators.

But to hold a little more closely to our theme—"Portland's Coastwise Trade" we will say at the beginning, that hailing from this port is the largest and most modern fleet of sailing vessels engaged in coastwise shipping, on the Atlantic coast, namely that owned and controlled by J. S. Winslow & Co. whose pennant of white is an ever familiar sight upon the Atlantic ocean. The Winslow fleet aggregate a tonnage of 35,300, gross and its monetary value is placed at something over \$1,400,000. Grouped about this magnificent fleet are several smaller ones which go to make up in the aggregate a most respectable showing.

Our principal coastwise business is coal, Portland being the chief distributing center for Maine, and here annually is brought something like 2,000,000 tons coming from New York, Baltimore, Phila., Norfolk and Newport News, besides which there was entered at this port during 1903 nearly 500,000 tons of foreign coal, or to be exact 453,089 tons. Much southern lumber, especially Georgia pine, is received here annually,



A SECTION OF THE WATER FRONT AT PORTLAND.

this being the sole occupation of the Deering, Winslow fleet.

Domestic exports to the southern coastwise ports is made up principally of lumber and ice taken on at the Penobscot and Kennebec rivers, and shipped to ports above named.



The coastwise lumber trade direct with New York occupies the entire time of another large fleet of packets, this being the second most notable branch of our coastwise trade. This unattractive yet industrious fleet being omnipresent, coming and going at all times.

To the more important ports of the Maine and New England coast large steamers have supplanted the former packet lines. These vessels are engaged in a combined passenger and freight business, and the frequency of their trips and the volume of merchandise carried prove conclusively the advance that has been made in this branch of the city's commerce. While there has not been a noticeable increase in the number of steamers plying between this city and Boston and New York, yet the increased tonnage and frequency of trips indicate very plainly that the business of the city is steadily increasing.

Portland is also the hailing port of an extensive fleet of the small type of coast trade packets, doing a profitable business with the smaller ports, east and south, whose waters are not navigable to vessels of a greater draught.

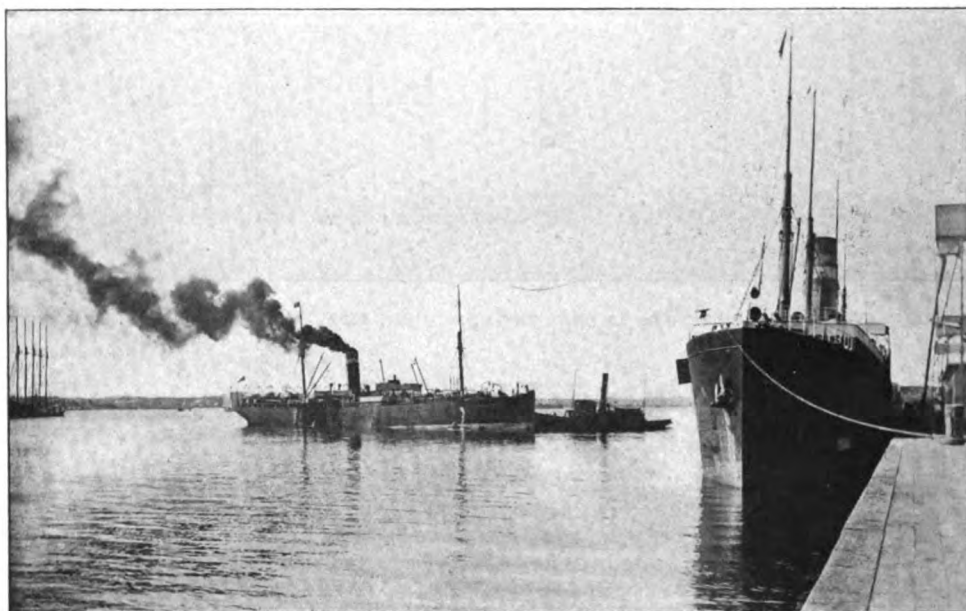
Our fresh fish business, "off shore fisheries," so

called, is another branch of Portland's coast commerce that is continually on the increase. These small swift crafts, know-

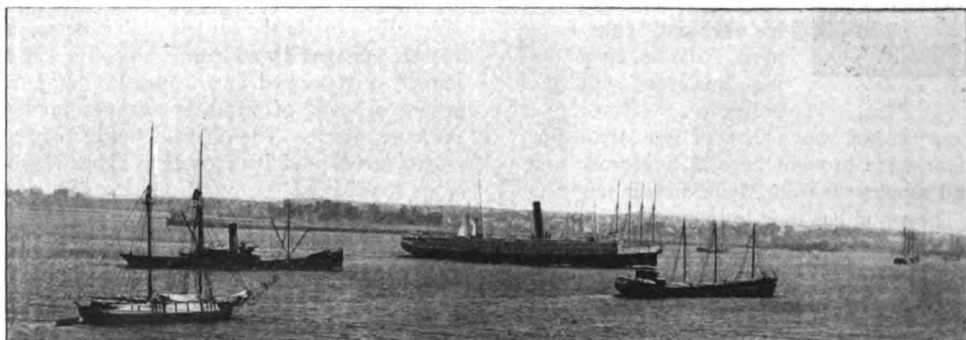
ing neither tide nor adverse winds, are coming in at the pleasure of their master and at a time best adapted for the disposing of their catch. Hundreds of these schooners, steamers, motor boats and Hamptons, all of which go to make up our fishing fleet, are big money makers for their owners, who in turn are the most indepen-

dent class of all that follow the sea.

Portland's coastwise trade although occupying a sort of secondary place in our maritime commerce, is nevertheless a large, prosperous and ever growing industry, and one that has done much towards making Portland known as the important commercial port she is



PORTLAND WATER FRONT LOOKING WEST.



A GLIMPSE OF PORTLAND'S INNER HARBOR



PORTLAND'S WATER FRONT LOOKING EAST.

#### BANANAS.

While the banana trade is not, strictly speaking, coasting trade because it is transacted with ports just beyond American dominion, still it is essentially an American trade because it is almost absolutely controlled by an American company. Formerly the transportation of bananas was handled exclusively in sailing vessels



but this method proved to have numerous disadvantages owing to uncertainty of arrival and the fleet was gradually supplanted by steamers. Today it is handled exclusively by steamers

which are specially constructed for the trade. About eighty steamers are now employed in this service and are excellent specimens of the ship builder's art. Unfortunately, however, but few of them have been constructed in this country. The banana trade of the United States with the

West Indies and Central America is handled almost wholly by the United Fruit Co., Boston, Mass.

The banana is one of the most interesting of all food products; it was originally found growing wild in the tropical east, but is now cultivated in all tropical and sub-tropical countries, where it constitutes one of the principal sources of food, taking the place

of cereals. The banana of today differs as widely from its ancestors as does the potato. There are 176 known varieties, and the productive power per acre is prodigious, the yield being from 125 to 175 bunches

to the acre. While bananas can be grown as far north as Florida, to reach their perfection a much warmer climate is needed and a much larger rainfall. Cuba is too far north to produce the very best results. The plant reaches its greatest perfection in the alluvial soil of the river bottoms along the coast lines of Central America, growing there sometimes to a height of 40 ft., whereas in Cuba the average height is about 12 ft. and in Jamaica about 18 ft.

The young bunch of bananas exists in embryo in the trunk of the plant, indicated by the swelling at that point. Then what is to be the stem of the bunch pushes out, with a gorgeous wine red blossom at its tip, and a short distance back appear the young bananas, very small, all pointing outward, but as they grow in size they bend and turn inward. A bunch of bananas is made up of so-called hands or ridges on a stem, the standard size being nine hands to a stem with from ten to fifteen bananas to a hand. In Central America where the banana reaches its greatest perfection the bunches and bananas are larger. The banana is planted in rows very much like hills of corn except, of course, at a greater distance apart. The farms sometimes contain 10,000 or 12,000 acres all planted in bananas—a most magnificent sight. When the stalk is cut down it is replaced by new ones starting as

suckers from the roots: these are all cut off except one, the most promising, which in its turn produces another bunch of bananas in the course of ten or twelve months, but no more

than four stalks are allowed to grow in one hill.

These stalks grow as large as 12 to 17 in. in diameter, and the leaves to the enormous size of 10 ft. in length and 2 ft. in width. As the stalk falls the bunch of bananas is cut off and carried away—the stalk left on the ground to decay.

The next step is to get the bunches to tide water, which is done in various ways by railroads, rivers or canals, or, when these are not available, on the heads of women.

It is the common sight in Jamaica to see a string of a dozen or more women each with a large bunch of bananas on her head and these they will carry for several miles without stop-

ping. The Jamaica negroes are educated from childhood to carry everything on their heads. School children are seen playing tag with books and even ink bottles on their heads. When a Jamaica belle goes to a social function

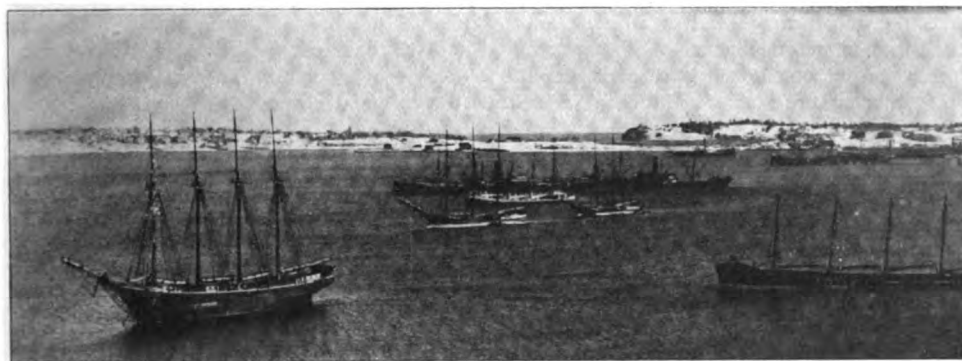
she carries her shoes on her head, and puts them on her feet when she gets there. Everything from a postage stamp to a Saratoga trunk is carried in this way.

The method of planting is somewhat as follows: Where necessary the land is first cleared of its brush or timber. In Costa Rica this is done simply by cutting down the trees. In six months, on account of the tremendous rainfall and great heat, everything has decayed except the trunks of the trees themselves, and the plants are set out amongst the trunks, and the trunks themselves entirely disappear at the end of another year.

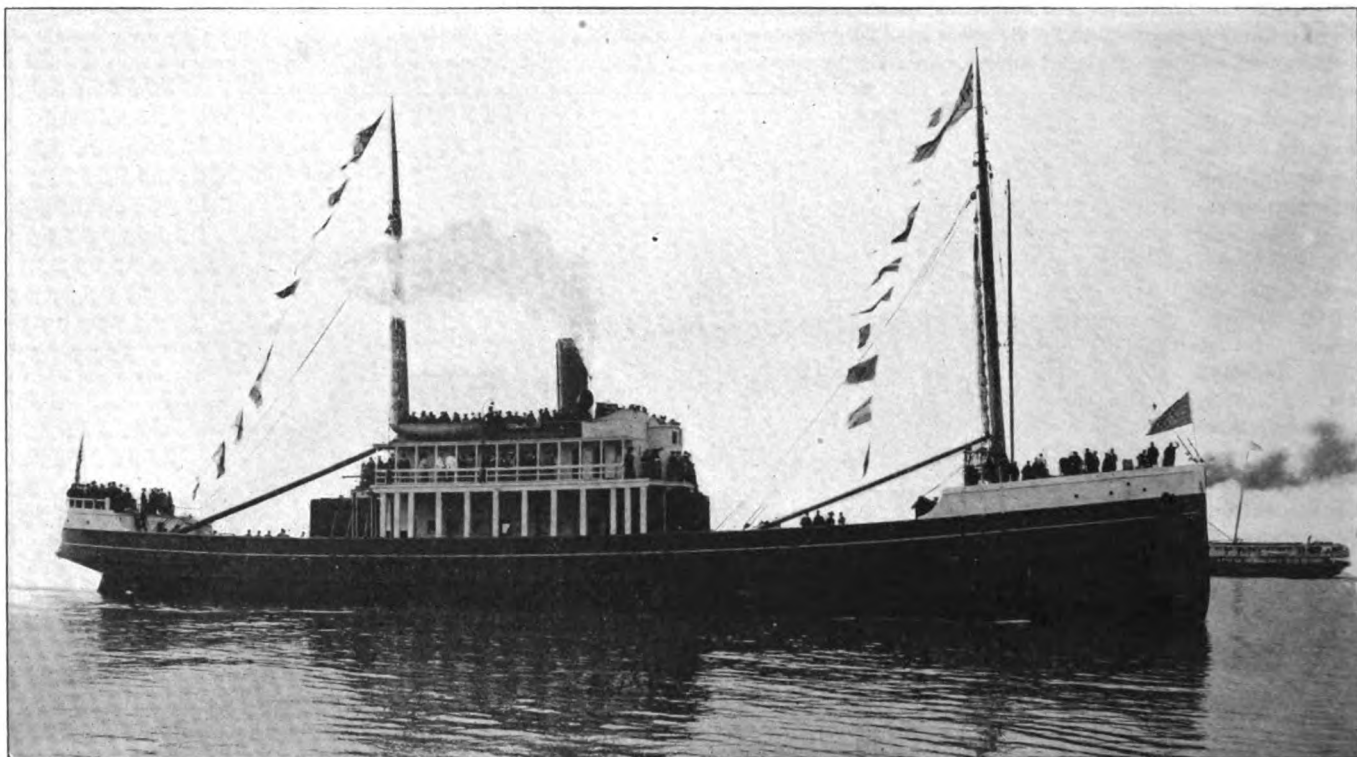
The banana was originally supposed to have seeds, but now these have all been lost and the propagation is effected by cutting off the roots from old plants and setting these in hills in the new land, four or five to a hill. In virgin soil no fertilizers are necessary; in fact, in Central America bananas have been grown on land continuously for twenty years without exhausting the soil. However, on the older lands in Cuba and Jamaica after a certain number of years fertilization is required to get the best results from planting. A banana comes to maturity from the root in ten or twelve months, and in the meantime the land has to be cleared two or three times; that is, the weeds and all foreign growth cut



COASTERS IN PORTLAND HARBOR.



SHIPPING IN PORTLAND'S LOWER HARBOR—100,000 TONS OF COAL AFLOAT.



STEAMER SHASTA IN THE PACIFIC COAST LUMBER TRADE.

out. This is done with the implement so universally used in tropical countries—the machete, resembling a straight sword. Each banana stalk produces but one bunch of bananas, and when it is ready for gathering the stalk is cut down with a machete.

The bananas are accumulated at point of shipment until the appointed steamer arrives, when she is rapidly filled with the fruit. The fruit is carried to the hatches either by men or women or by loading machines working on the principle of endless belts. Originally bananas were shipped by sailing vessels, but the process was too slow and the loss too large, so now all fruit is brought by steamer, the least possible time from plant to consumer being essential. The latest development is ships of 5,000 tons capacity, capable of carrying 40,000 bunches of bananas at a trip. Refrigeration has been added in order that the fruit can be cut full grown and brought to the Northern markets in perfect condition.

On their arrival in the United States the bananas for the local market are loaded into wagons—the bananas for the interior are loaded from the steamers into cars and shipped out, frequently in train loads. New Orleans and Mobile supply all the territory west of the Mississippi, and part of that to the eastward. Solid train loads of bananas, each in charge of two competent men to watch the temperature of the cars, leave these ports daily, some destined for markets as far north as Oregon and Alaska.

The secret of success lies in having the fruit properly grown, cut at the right time, handled without bruising, bringing it into the northern markets before the green fruit begins to color, and then distributing it immediately to consumers, with every item of expense kept at the lowest point. In tropical countries quite a proportion of the fruit is cooked, but in the northern markets the greatest part of the fruit is now eaten raw, and it is the main purpose of this little book to teach people to use it cooked as a vegetable.

It is nourishing, wholesome food to almost everybody. Very often growing children, to whom at times other food has become distasteful, will subsist for a long time solely on bananas or bananas and milk, and in the torrid zone many

people subsist on bananas alone. The banana, of today is one of the cheapest foods, as well as being one of the most nourishing, costing the consumer, per pound, no more than the common vegetables or cereals, thus making it a food for the millions.

The history of the development of the banana business is comprised in the history of the Boston Fruit Co. and other companies which were merged into the United Fruit Co. The consumption of the banana in the United States increased very rapidly in the latter part of the nineteenth century. The credit of taking a broad and comprehensive view of the situation belongs to the management of the Boston Fruit Co. fully realized that to make it permanently profitable, it was absolutely necessary to do a very large business on a small margin of profit; that the basis of profits must be found not in controlling markets, but in instituting every economy in raising, shipping and marketing the fruit, improving the quality and decreasing the cost so it could always be sold at low prices; in short, operating on the principle of making the dealers their partners with low cost goods.

The United Fruit Co. has a fleet of about eighty steamers constantly bringing bananas from various points in the tropics to the different parts of the United States. As has been well said, the United Fruit Co. and its predecessors have conferred a lasting benefit on the United States by supplying it with an appetizing, nutritious fruit at very low prices. This company handled 75 per cent of the fruit imported in 1903, a total of 30,000,000 bunches, or about 3,000,000,000 bananas, an average of forty bananas per year for each person in the United States. This enormous business is the growth of thirty years. In 1872 the total importation was not over 500,000 bunches. The fruit at that time was transported principally by sailing vessels, and retailed for not less than ten cents per banana.

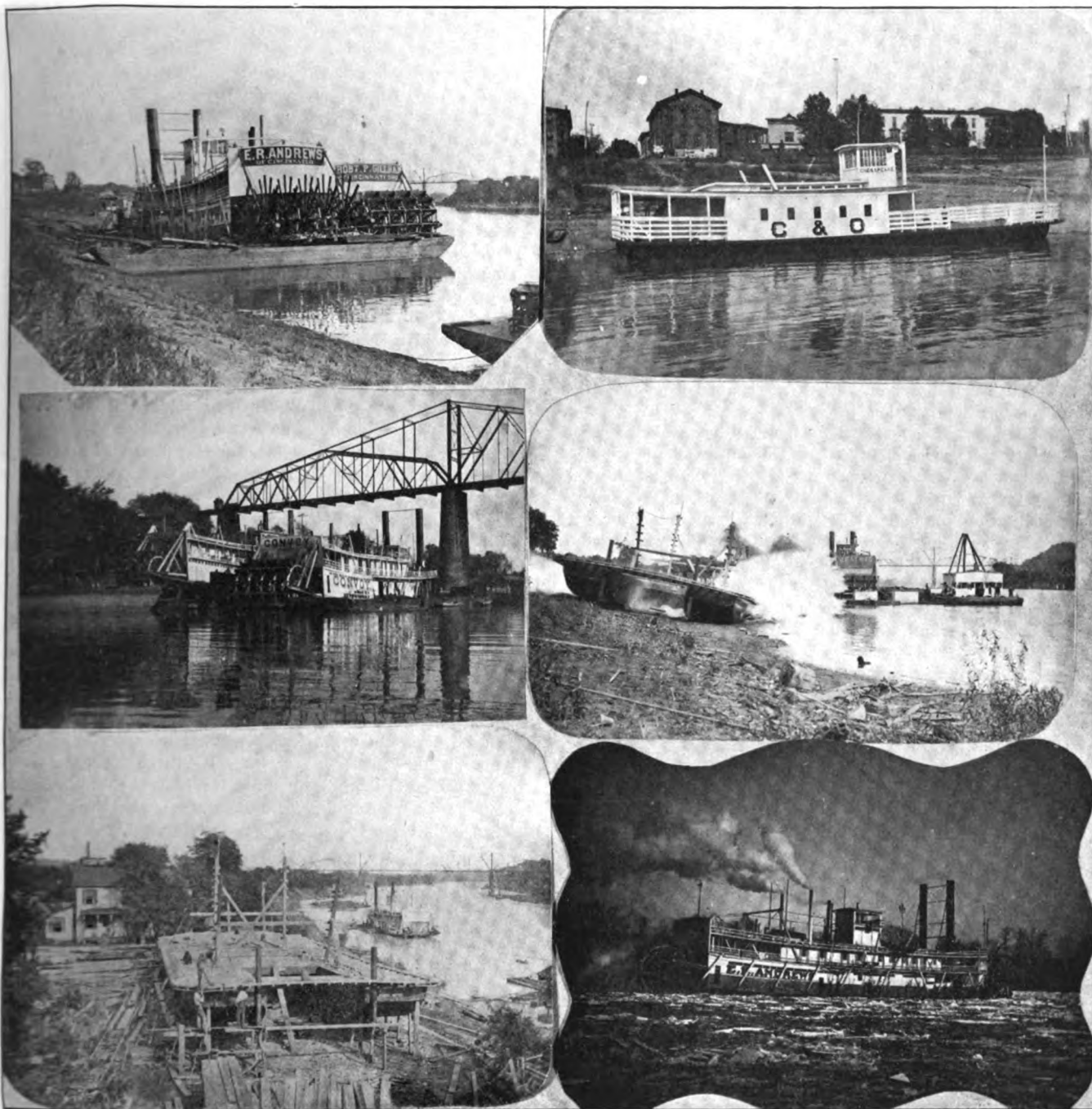
#### PACIFIC COASTING STEAMER SHASTA.

One of the latest additions to the fleet of lumber steamers for the Pacific coast trade is the steamer Shasta, recently completed by the Fulton Iron Works, San Francisco, for

E. K. Wood Lumber Co., of San Francisco. Her general dimensions are: length over all, 207 ft.; beam molded, 37 ft. 4 in.; depth of hold, 14 ft. 6 in. The hull is built of Oregon pine. She has a triple-expansion engine with cylinders 12½, 23 and 40 in. diameters by 30 in. stroke. Steam is supplied by two Scotch marine boilers 10 ft. 6 in. diameters by 10 ft.

#### DECLINE OF RIVER TRADE.

Of course the lake and river trade, being a part of the domestic transportation system of the country, is included in the coastwise laws. For all of these trades special types of vessels have been designed, the like of which is not to be found elsewhere in the world. It is to be noted in the statistics pub-



SOME TYPES OF RIVER STEAMERS.

long, allowed a working pressure of 185 lbs. There is also one 52 in. vertical donkey boiler. The Shasta is equipped with a complete oil burning system, the fuel oil tanks of 965 lbs capacity being located on main deck as shown in the picture. On the trial trip she attained a speed of 11 knots over a measured mile with 675 H. P.

The battleship Milwaukee will be launched at San Francisco Sept. 10. Miss Janet Mitchell, daughter of the late United States Senator John L. Mitchell, has been selected to launch the cruiser.

lished in this issue that of these two great divisions of internal transportation, river and lake, the lake trade has been growing phenomenally while the river trade has been declining. The decline of the river trade is to be accounted for by the great development of the railway systems of the United States and owing to shallow draught and consequently limited carrying capacity river steamers are unable to compete with the railways. River transportation has been declining for years and during the past ten years the decline has been marked.

On the other hand the lakes handle a traffic that could not



possibly be handled otherwise. Were some frightful convulsion of nature to change the face of the earth and dry up the great lakes of North America the trade of the lakes would not be transferred to the railroads. It would simply cease to exist. The bulk of lake trade is the transportation of ore which is carried at so low a rate that railroads could not possibly meet it and operate at a profit.

The exigencies of river service have called into being a particular type of craft whose distinguishing characteristics are a flat bottom and an enormous stern wheel. They were built to encounter shoals and snags and to make landings where no docks appear. This type of vessel has very satisfactorily handled the river business of the United States. Accompanying this article are some photographs which show the type quite well and the character of service which they are required to perform. In the group of pictures will be noted the photograph of the *F. R. Andrews*, which was built at Howard's Ship Yard, Jeffersonville, Ind., in 1894 for the Campbell's Creek Coal Co., Point Pleasant, W. Va. The *Andrews* is built of steel up to the boiler deck. Her engines are 20 in. by 8 ft. of the Frisbie make, supplied with steam from six boilers allowed a pressure of 200 lbs. She is something of an ice crusher as well and undertook to keep the Kanawha river from gorging last winter. She broke solid ice 10 in. thick with her wheel, which, however, had to be repaired ten or twelve times during the operation.

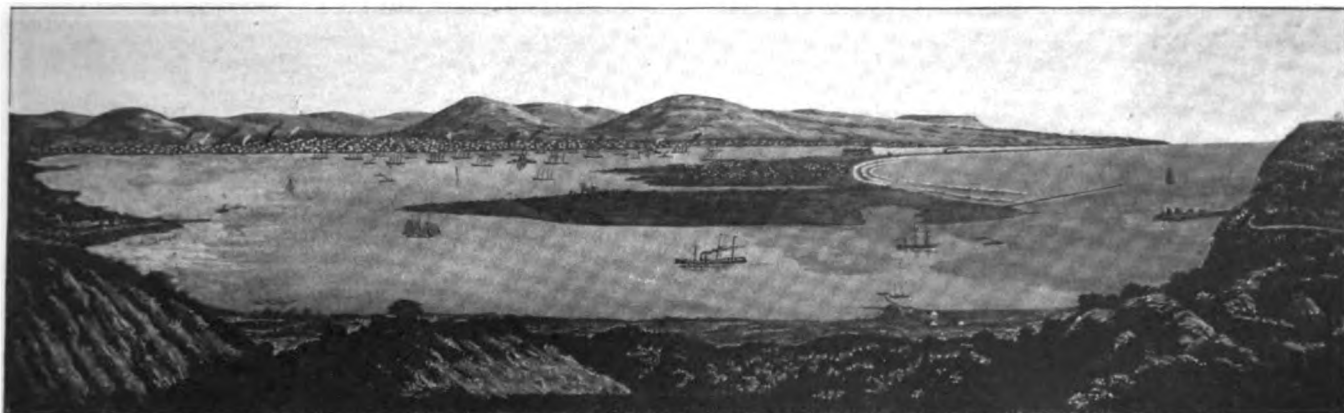
The ferry boat *Chesapeake*, built for the Chesapeake & Ohio Railway Co.'s service between Portsmouth, O., and South Portsmouth, Ky., is a fair type of river ferry boat. She was built by the Kanawha Dock Co. at Point Pleasant, Va., under the supervision of Capt. J. F. Morgan, superintendent of ferries for the Chesapeake & Ohio Railway Co. with headquarters at Ironton, O. The *Chesapeake* is 115 ft. long, 34 ft. wide and 4 ft. 6 in. deep. She is of the boat jack or recessed stern wheel type, the wheel being placed in recess in the stern of the boat. The hull is of oak, sheathed with steel. Power is furnished by two engines 13 in. by 5 ft., non-condensing horizontal, both direct connected with the stern wheel. Steam is supplied by one locomotive fire-box boiler 20 ft. long, 54 in. diameter and allowed a pressure of 175 lbs. The *Chesapeake* is equipped with a complete electric light outfit, including searchlight.

### THE ATLANTIC YACHT CLUB.

As one enters the great New York harbor the eye becomes fixed on a very handsome and imposing structure, located close to the shore and at a place known as Sea Gate—the home of the Atlantic Yacht Club. It is but a few miles distant from the famous Coney Island and a more commodious spot could not have been selected. The club house is almost surrounded by the handsome cottages of many prominent and wealthy business men of New York city, a great many of whom are members of the club. It is one of the oldest yachting clubs in existence, its incorporation dating back to the year of 1866 and several of its first members are still to be seen around the club house talking of the many good days gone by. For the accommodation of its members and the cottagers a special boat is run by the club from the battery at New York city to the club house pier, a distance of some 35 or 40 minutes' sail. Those of the members who do not have a cottage enjoy the spacious apartments of the club set aside for members. The success of the club has long ago been assured and today on its roll of membership are to be found the names of the most prominent yachtsmen in the United States as well as some of Europe. Many of its fleet have been victors in numerous contests sail and steam. The library of the club is one of beauty and aside from numerous nautical works by well-known authors it contains charts, weekly, semi-weekly and monthly nautical publications, prizes, etc. No matter whether there be a regatta or not the spacious club house is at all times well

patronized by its members and their guests and the view from the club house is one that can be only fully realized by those who chance to see for themselves the beauty of the harbor with its craft of all kinds passing in and out. The club fleet consists of forty-one schooners, eighty-nine single-masted vessels and yawls, sixteen cat-rigged, ninety steamers, from 302 ft. length over all down to the little gasoline type of say 25 ft. length over all, of which there are about six vessels; twenty-nine launches, eleven of which are naphtha and two gasoline; three house boats one 118 ft. over all; another of 100 ft. and another of 80 ft. There are now over 510 active members in the club; sixty-seven members are life members and fourteen junior members; 127 of the members are also members of the New York Yacht Club; the flag members number two and the following are the honorary members—president of the United States, secretary of the navy, secretary of the treasury, collector of the port of New York, admiral of the station, navy yard, N. Y.; the inspector of the third district lighthouse, Tompkinsville, S. I., N. Y.; Kaiser Wilhelm; Admiral Prince Henry of Prussia; Robert S. Church, New York city; Sidney V. Lowell, Brooklyn, N. Y.; Earl of Dunraven; Latham A. Fish, Brooklyn, N. Y.; Sir Thomas Lipton. Officers in the United States navy who are members are Rear Admiral Arthur Burtis, Lieut.-Com. John C. Leonard, Rear-Admiral Geo. W. Melville, Lieut.-Com. Walter J. Searles, Lieut.-Com. James T. Smith, Rear Admiral Edwin Stewart. The chaplains are well known clergy and are Rev. Lindsay Parker, Rev. Joseph J. Reynolds, Rev. Wm. H. Thomas, Rev. A. A. Willetts, D. D., Rev. Wm. Lewis Moore, Rev. Geo. Weed Barhydt. The absence for some time of the commodore who has not been in the best of health for some time has been keenly felt by the members and the glad news that he will be on deck again shortly was well received by everyone. It would be hard to find a more ardent supporter of the motor boat than Commodore Harrison B. Moore. In the recent events given under the auspices of his club he made a donation of \$1,000 for prizes and it will not be long before he takes a more active interest by possessing one of these craft. The officers of the club are: Commodore, Harrison B. Moore; vice-commodore, F. D. Underwood; rear-commodore, Edwin B. Havens; fleet captain, Benjamin M. Whitlock; secretary, T. Alfred Vernon; treasurer, Charles T. Pierce; measurer, Henry J. Gielow; fleet surgeon, Paul Outerbridge, M. D.; trustees, one year, Edwin Gould, J. Rogers Maxwell; two years, Harris K. Smith, Spencer Swain; three years, Robert E. Tod, Alfred W. Booth; ex-officio, T. Alfred Vernon and Charles T. Pierce; regatta committee, Henry J. Gielow, Frederick Vilmar, W. A. Minott; membership, George D. Provost, Walter H. Nelson, F. J. Havens; house, Spencer Swain, S. Edward Vernon, George D. Provost; library, F. T. Cornell, Hendon Chubb, John E. Beggs; entertainment, S. Edward Vernon, George G. McIntosh, Joseph H. Scranton; nominating, E. B. Havens, H. G. S. Noble, W. L. Pettibone, Geo. D. Provost, H. B. Chamberlain, Paul D. Barnard.

The Austro-Hungarian Steamship Line, with the assistance of the Hamburg-American Line and the North German Lloyd Line, decided on July 26 at Trieste to increase its capital from \$1,000,000 to \$4,000,000 for the purpose of adding thirteen vessels to its existing fleet and establishing fortnightly sailings between Trieste and New York. The company will be known as the United Austrian Navigation Co. and will work in close harmony with the two German lines, which have taken \$1,250,000 of the new stock. Herr Ballin, director general of the Hamburg-American Line, and Herr Wiegand, director general of the North German Lloyd Line, have joined the board as directors, though the company will remain an exclusively Austrian concern. It is expected that the new company will have the support of the Austrian government.



SAN DIEGO'S NATURAL, LAND-LOCKED HARBOR.

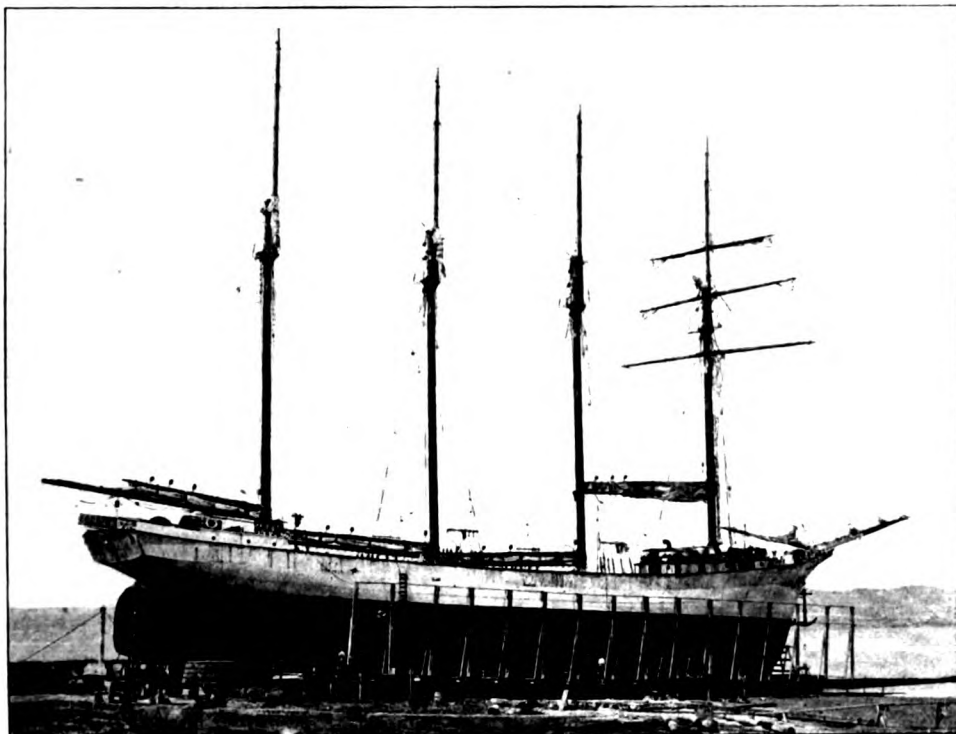
**THE HARBOR OF SAN DIEGO.\***

The harbor of San Diego is a natural one. The depth of water in the ship channel across the bar at the entrance of the bay is 28 ft. at lowest low water or 30 ft. at high water. The bottom is uniformly good, no rocks having been discovered either in the bay or approaches, there is much less swell on the bar than on any other bar along the Pacific coast, and the mariner in entering the port does not have to fear or guard against any treacherous currents. An examination of the United States signal service records for the past

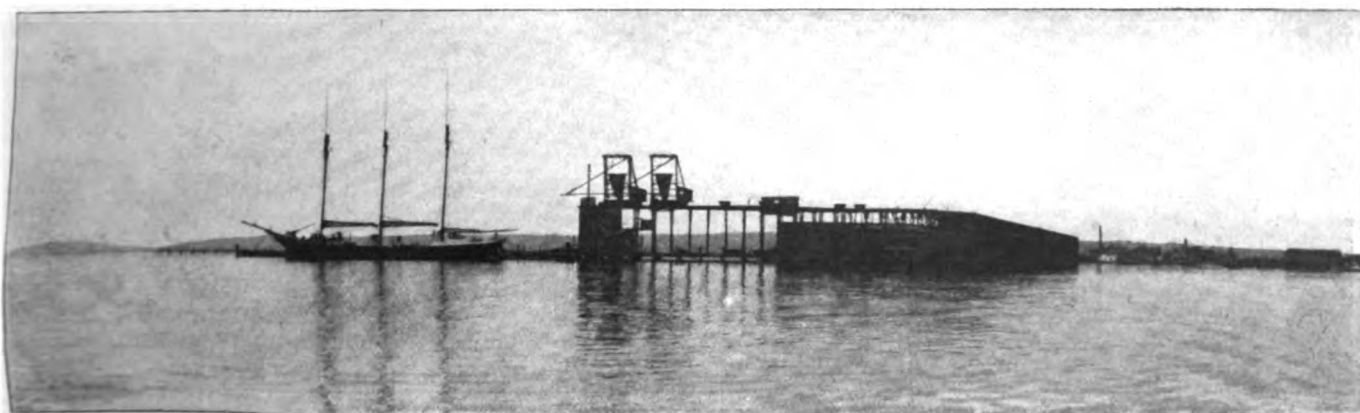
twenty-five years shows that at San Diego there was on an average but twelve foggy days throughout each year; the average wind velocity as ascertained from the same source

being  $5\frac{1}{2}$  miles per hour. Winds of from 25 to 30 miles per hour average two per annum. The highest velocity ever attained was 40 miles from the north-west, in February, 1878.

The total area of the bay is about 22 square miles, varying in width and about 10 miles long. Conveniently located near the entrance of the harbor with a wharf running into deep water is the quarantine station, one of the most

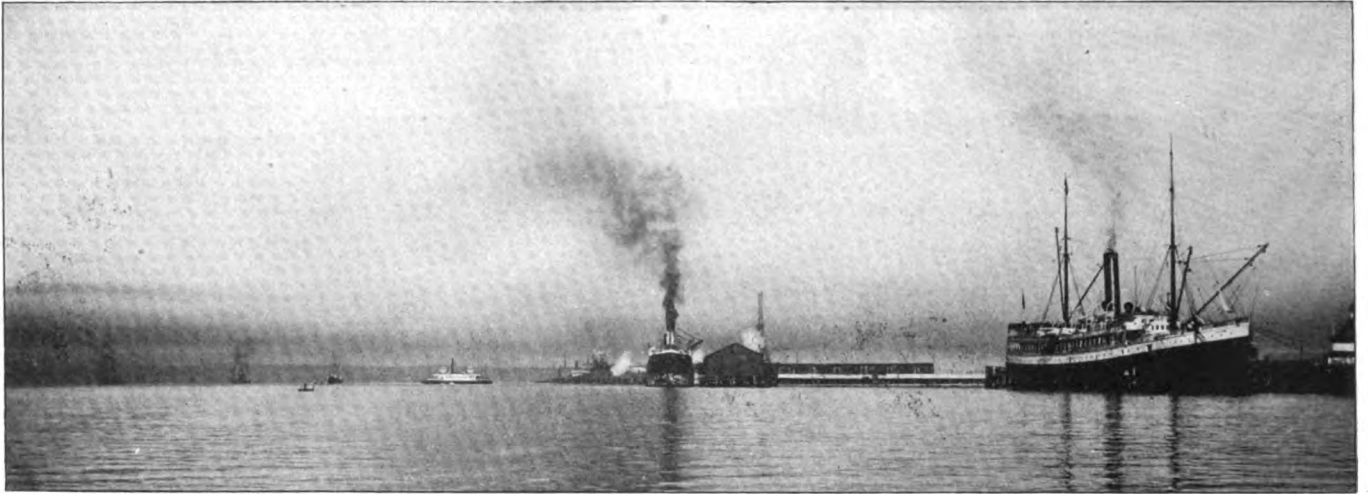


ON THE MARINE RAILWAY AT SAN DIEGO.



SPRECKEL'S COAL, BUNKERS AT SAN DIEGO.

\*By H. P. Wood, Secretary San Diego Chamber of Commerce.



THE WATER FRONT AT SAN DIEGO.

complete in the United States, being thoroughly equipped with detention buildings supplied with modern fumigating and disinfecting plants. On the Coronado side of the bay is a marine railway capable of accommodating vessels of large tonnage. Near the water front are well equipped foundries and machine shops fully prepared to do the very best work quickly and at reasonable figures. At the coal bunkers belonging to the Spreckels Commercial Co., which are among the largest and most complete on the Pacific coast, steamers can always find a supply of good coal with every convenience for loading same.

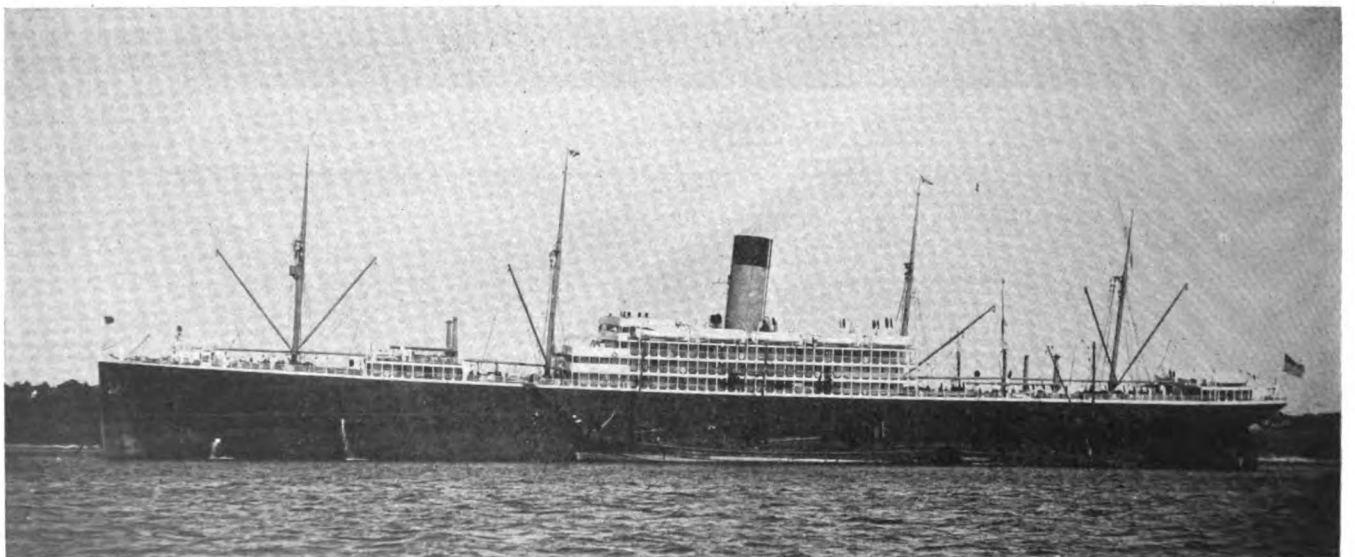
There are a number of wharves running into deep water with from 18 to 35 ft. at low tide. The wharfage is ample for a large commerce and is in first-class condition.

A portion of the peninsula of Point Loma which guards the entrance to the bay, is owned by the government, some 400 acres of which are under the control of the navy department. A section of this land has been surveyed for a naval coaling station, plans for which have been drawn and it is expected that the work of construction will commence at an early date. A commission has already reported favoring the establishment of a naval training station at this point, and the probabilities are that with the rapid development of commerce on the Pacific, the construction of the Tehuantepec

railway, the ownership by the United States of the Panama railroad and the early construction of an Isthmian canal the port of San Diego will soon become a great naval rendezvous. The strategic position of the magnificent harbor warranting such a belief.

#### STEAMSHIP MINNESOTA.

The great steamship Minnesota, built for the Great Northern Steamship Co. by the Eastern Ship Building Co. of New London, Conn., was inspected by thousands of persons in New York last week prior to her departure on her maiden trip to Seattle, which is to be her regular port of departure for the orient hereafter. She arrived at New York fresh from her builder's hands and she was given a royal welcome, the flags at Fort Hamilton, Wadsworth and Lafayette being dipped as she passed by. The ship was carefully inspected and much praise was bestowed upon her designer and builder, President Charles R. Hanscom of the Eastern Ship Building Co. The Minnesota, with her sister the Dakota, now nearing completion at the yard, are the largest steamships ever constructed in the United States. Mr. J. J. Hill, when he determined to build these two ships entrusted the work absolutely without even so much as a contract, to Mr. Hanscom. Like the great White Star liners they are built upon the percentage



STEAMSHIP MINNESOTA OF THE GREAT NORTHERN STEAMSHIP CO.'S FLEET.

[Built by the Eastern Ship Building Co., New London, Conn.]

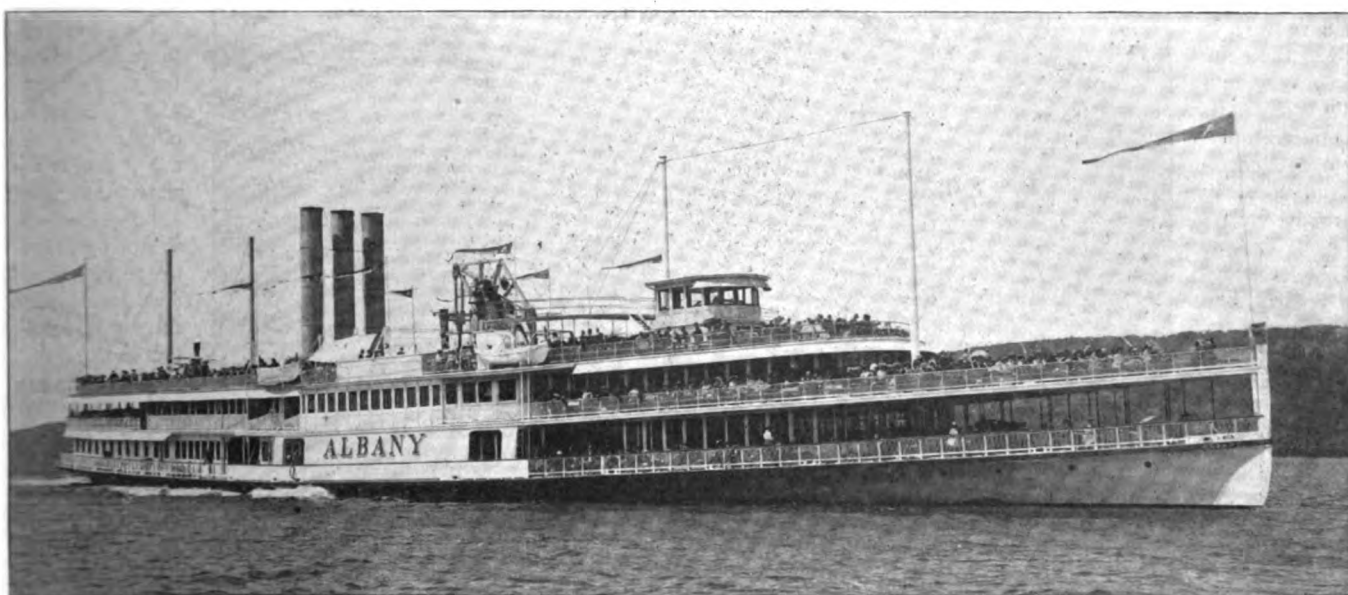


plan, that is the builder receiving a certain percentage over shop cost for his work. Unlike the builders of the great White Star liners, however, Mr. Hanscom was without the vestige of a plant in which to build the ships. The first thing that he did was to look about for a suitable site for the ship yard and he found it at New London, Conn. He found what he considered to be a natural ship yard at that point and the work of building the ship and establishing the ship yard went hand in hand together. Incidentally a village grew about the plant, so that Mr. Hanscom really has the credit of creating a small town as well. This singularly original and daring proceeding of projecting two such mammoth liners without so much as a tool wherewith to build them attracted the attention of the entire ship building world, and it can truly be said that the progress of these ships has been watched with great interest by all countries. Both ships, as stated, are the largest ever

ly equipped with Blake marine pumps, including vertical featherweight air, vertical simplex feed, horizontal duplex fire, bilge pumps, horizontal simplex auxiliary condenser pumps, and combined condenser and heater pumps.

#### HUDSON RIVER DAY LINE.

The Hudson River Day Line of steamers operating a daily (except Sunday) service between New York and Albany, is probably more widely known than any other line of steamers more widely known than any other line of steamers in America; and we may add, more widely known than any inland line in the world. It was founded by the late Commodore Alfred Van Santvoord and has remained practically under one control for about fifty-six years. The liberal progressive policy which he inaugurated is still carried out as nearly as possible.



STEAMER ALBANY OF THE HUDSON RIVER DAY LINE.

built in this country. They are 630 ft. long, 73 ft. 6 in. beam, 56 ft. deep to the upper deck. On a draught of 32 ft. they displace 33,000 tons and when loaded to the Plimsoll mark will displace 38,830 tons. They are built of steel throughout and constructed to meet the highest classification of Lloyd's. The ships are divided transversely into thirteen watertight compartments with a longitudinal bulkhead from keel to deck which is watertight in engine and boiler spaces, making fifteen watertight compartments about the double bottom. The double bottom extending from end to end is 6 ft. deep and divided into thirty separate watertight compartments which hold in all 3,966 tons of water ballast. In addition to this there are four twin jack trimming tanks containing 1,100 tons. There are five steel decks extending the full length of the ship, in addition to which there are four steel decks completely covered with wood in passenger spaces, making nine decks in all. Both vessels are known as the intermediate type of passenger and freight steamer, being designed for moderate speed and enormous carrying capacity. The passenger accommodations are on the upper, promenade, bridge and main decks and in size, comfort and convenience are unrivaled by any ships that float. The main engines are of the triple-expansion type with cylinders 29, 51 and 89 in. diameters by 57 in. stroke, supplied with steam from sixteen Niclausse water-tube boilers with a heating surface of 40,615 sq. ft. and a grate surface of 1,081 sq. ft., the steam pressure being 250 lbs. The total space available for carriage and coal is 1,072,000 cu. ft. and the deadweight carrying capacity is 25,000 gross tons. The cargo handling devices are very complete. Both ships are complete-

The handling of pleasure tourists is here as far refined as can be and the ease and rapidity with which large numbers of passengers and baggage are handled at various stops is nowhere else appreciated. No freight of any kind is carried and only anthracite coal is used; and as very large crews are carried, the steamers are as immaculate as can be. More foreigners probably make their initial American trip on the Day Line than elsewhere; and if first impressions count for anything, this is fortunate.

One of the most important departments in the service is the cuisine to which as much care is given as in one of the great hotels of the city. This, coupled with the splendid music, the grand scenery of the Hudson valley, and the absolute sense of security with which one is inspired here, makes a Day Line trip a memorable occasion.

The two steamers, Albany and New York, are much alike in general features and the accompanying cut is very descriptive, length 340 ft. by 76 ft. beam over all; speed 22.5 miles through the water. The splendid steamer Mary Powell is also controlled by this line, and plans are out for a new steamer, of which descriptions will be given later.

Mr. Robert Logan, assistant general manager of the Amering Ship Building Co. has made arrangements whereby Mr. Edward Hopkins, naval architect and designer for the Detroit Ship Building Co., will go to Cleveland to superintend the construction of the new Anchor Line passenger and freight steamer recently ordered. The vessel is to be built in Cleveland.

# The Trade of Tacoma.

By J. S. WHITEHOUSE,  
*Secretary Tacoma Chamber of Commerce.*

Tacoma is the youngest of the maritime cities on the Pacific coast. When this city was only a mill hamlet occasional small shipments of merchandise was brought down from San Francisco on the schooners that took the lumber down. After the completion of the Northern Pacific railway in 1886, the city grew very rapidly and its commerce increased correspondingly. In foreign commerce Tacoma is exceeded only by San Francisco on the Pacific coast and is rapidly overtaking that port; in deep sea commerce, both foreign and coastwise, Tacoma occupies the same position. In the local coastwise commerce of the North Pacific coast, she also occupies second place and is rapidly forging ahead.

Tacoma has the largest fleet engaged in foreign business of any Pacific coast port and the largest fleet of American bottoms engaged in the foreign business of any port in the United States except one. Plying between Tacoma and San Francisco are thirteen steamers operated by three distinct companies, of an aggregate of 28,601 tons and valued at approximately \$2,600,000. There are thirty-two steamers, operated by nine distinct companies of an aggregate tonnage of 57,473 and an approximate value of \$5,000,000, engaged in the

trade between this port and Alaska.

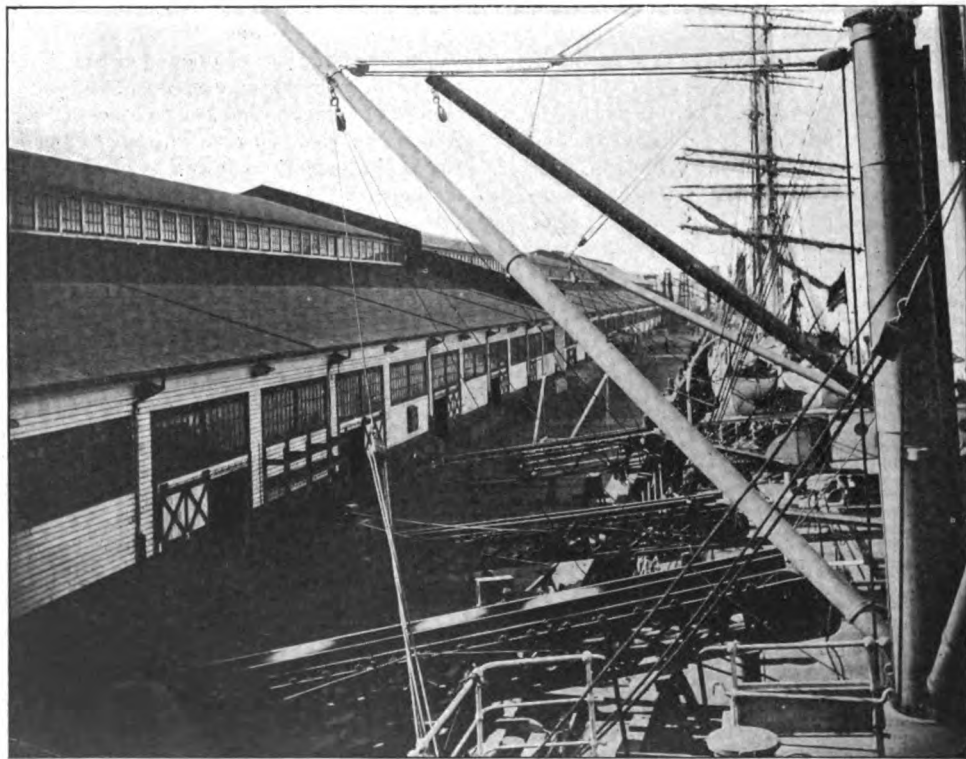
The American-Hawaiian Steamship Co. operates a line of nine steamers from Tacoma to Hawaii, thence to New York, of an aggregate tonnage of 57,223 and an approximate value of \$8,000,000. In the local Puget Sound business there are about forty steamers of all kinds and classes of an approximate tonnage of 12,000 and a value of from ten to one hundred and fifty thousand dollars each.

To Alaska are shipped immense quantities of manufactured goods, lumber and general merchandise. The vessels bring back ore to Tacoma smelters, fish and furs. To San Francisco and other Californian points are shipped lumber, manufactures of lumber, coal, wheat, flour, and other manufactured goods, and the vessels bring back semi-tropical fruits and vegetables of that state and general merchandise.

The sailing vessels are confined almost exclusively to the lumber business. In the year 1903, there was shipped 84,000,000 feet of lumber from Tacoma to domestic ports, chiefly to California. These were carried in ninety-three cargoes. Many of the sailing vessels are owned by the mills shipping lumber and are engaged regularly in the traffic. The vessels make from six to twelve trips per



THE WATER FRONT OF TACOMA, WASH.



LOADING VESSELS BY ELECTRIC CONVEYORS AT TACOMA



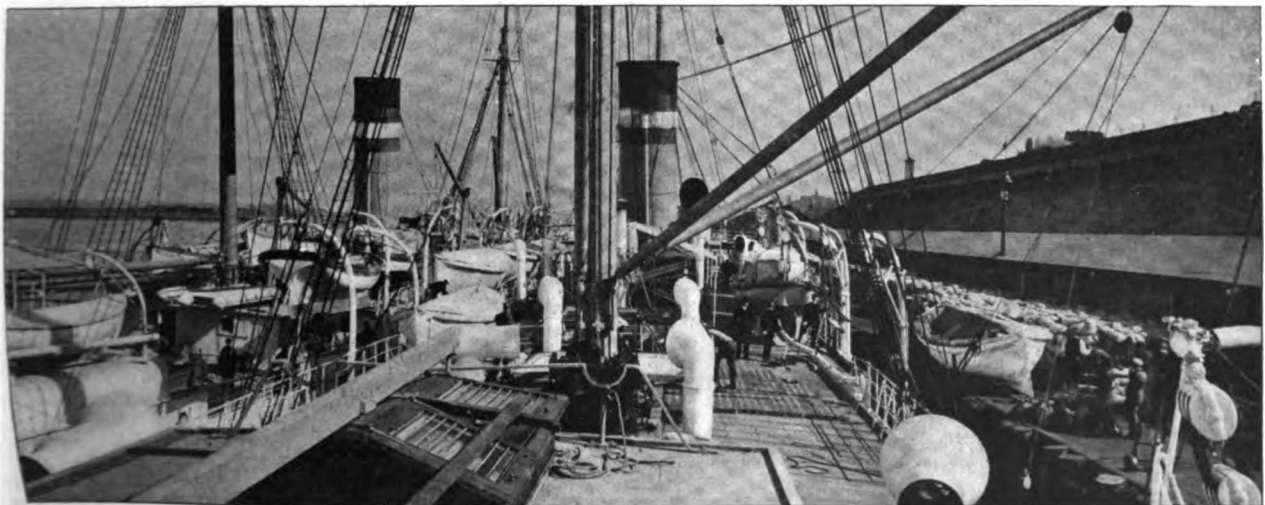
A FLEET OF VESSELS LOADING LUMBER AT TACOMA FOR ALL PARTS OF THE WORLD.

year.

The total value of the lumber shipped coastwise amounted to about \$1,100,000. The coal shipments to California averaged 120 cargoes consisting of 600,000 tons per year.

The total domestic exports from the port of Tacoma amounted to about \$13,000,000 per annum and the imports to about \$7,000,000 per annum. Commerce of all kinds is growing rapidly. The different warehouses on the waterfront of this city have a total capacity of over 300,000 tons

and are taxed to their utmost capacity. Their total length is 11,000 lineal ft. Conditions in relation to the shipping industry of Puget Sound with Alaska on the north, which, for a long time must get its supplies of all kinds from the Puget Sound cities, and California on the south, which must secure its lumber, coal and a large number of manufactured articles from this section, are such that expansion in the domestic trade will be very rapid and the number of vessels used increase accordingly.



UNITED STATES TRANSPORTS LOADING FOR ALASKA AND THE PHILIPPINES AT TACOMA WHARVES.



## COASTING TRADE OF PACIFIC COAST.\*



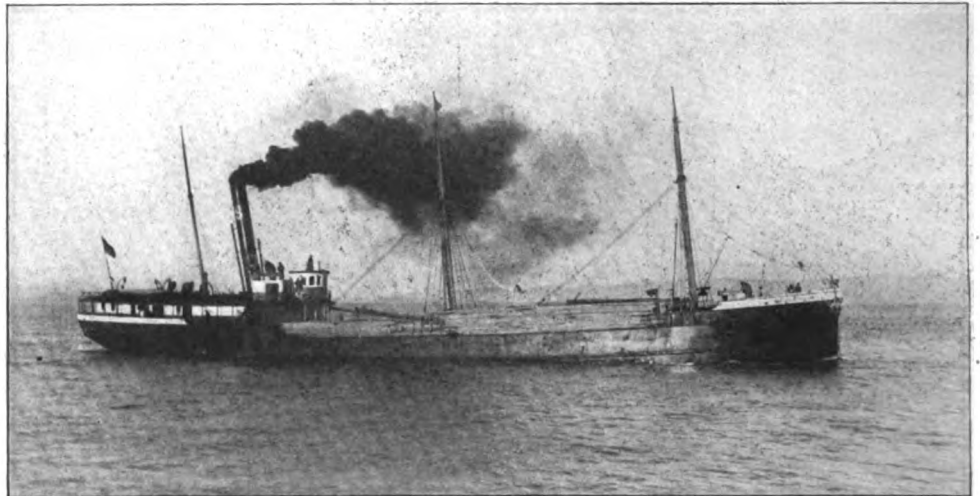
Considering the fact that all the commercial development of the Pacific coast has been accomplished within the space of half a century and the further fact that the coast line which is supplied with American products extends more than 1,500 miles each way from the Golden Gate at San Francisco, the coastwise traffic has made excellent growth. Prior to 1854 it was comparatively nothing, but about that time the influx of gold

portions and it has grown steadily ever since, so that at present it is a very important factor in marketing the products of the state. The coasting trade of Puget Sound which to-day stands second to San Francisco in the number of vessels employed and the extent of business was insignificant prior to 1870, but in the following ten years a steady and prosperous growth was made and thus was laid the foundation of the great traffic of the present.

In coasting trade as in all other commercial and maritime affairs on the Pacific coast, San Francisco obtained a precedence and prestige which it has always retained and doubtless always will maintain. In round numbers the annual value of the coasting trade which enters and departs through the Golden Gate, may now be safely stated at a little over \$8,000,000. The traffic embraces within its service more than 270 vessels fully one-third of them being steam craft. These vessels ply down the coast as far as Magdalena bay and to the north as far as St. Michaels and the business has proved profitable to all engaged in it. During 1903 the arrivals aggregated 1,696,744 registered tons of which 1,423,330 were steam and 273,414 sail tonnage. During the same year the departures amounted to 1,811,243 registered tons of which

seekers was so great that the industrial development of the many natural resources of California and Oregon commenced and the products of the farm, the lumber mill and the tannery sought means of transportation to the centers of population. Small coasting vessels were built at San Francisco, Benicia, Eureka, Monterey and Coos Bay. They did a good business from the start and by the close of 1858 over fifty such craft made regular trips up and down the coast with San Francisco as their chief port. This was the origin of the coasting traffic on the Pacific coast.

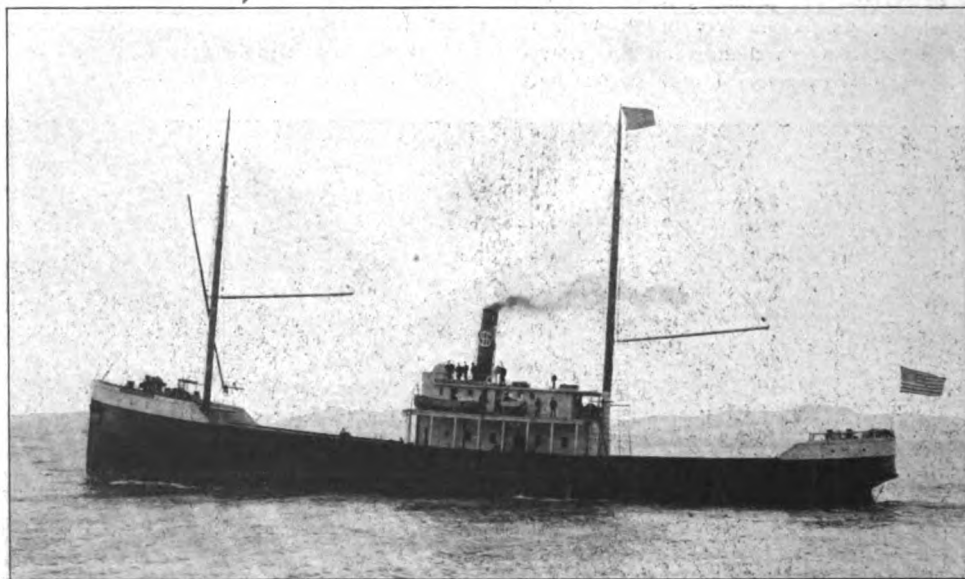
It is practically impossible to compare this development with any other portion of the continent, for no other state or section of the country bordering on the coast was settled so largely in such a short space of time. It is sufficient to say, however, that within the first ten years the coastwise trade of the Pacific coast made as large a development as did the Atlantic trade within the first century of its growth. About 1860 the Oregon coast trade commenced to assume good proportions



STEAMER MELVILLE DOLLAR IN THE PACIFIC COAST LUMBER TRADE.

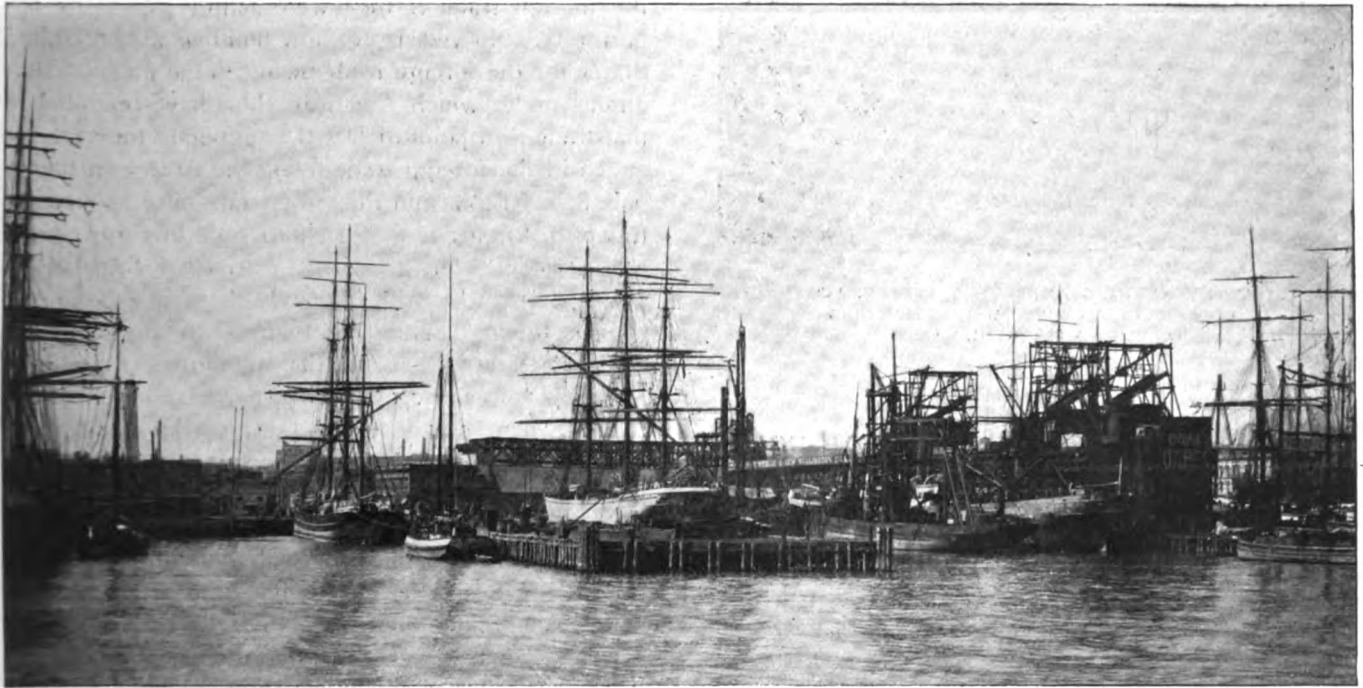
1,434,599 were steam and 376,644 sail. The first six months of the present year show a slight increase over the corresponding period of last year.

There are twenty-seven steamers ranging from 500 to 1,600 tons engaged in this traffic exclusive of the large passenger steamers regularly plying between San Francisco and coast ports and fifty-four steam craft of less than 500 tons. In addition there are between fifteen and twenty



STEAMER ROBERT DOLLAR; A FAIR TYPE OF PACIFIC COAST TRADER

\*By E. Scott, Secretary San Francisco Chamber of Commerce.



VIEW OF PORTION OF WATER FRONT OF SAN FRANCISCO SHOWING COASTING COLLIERIES DISCHARGING.

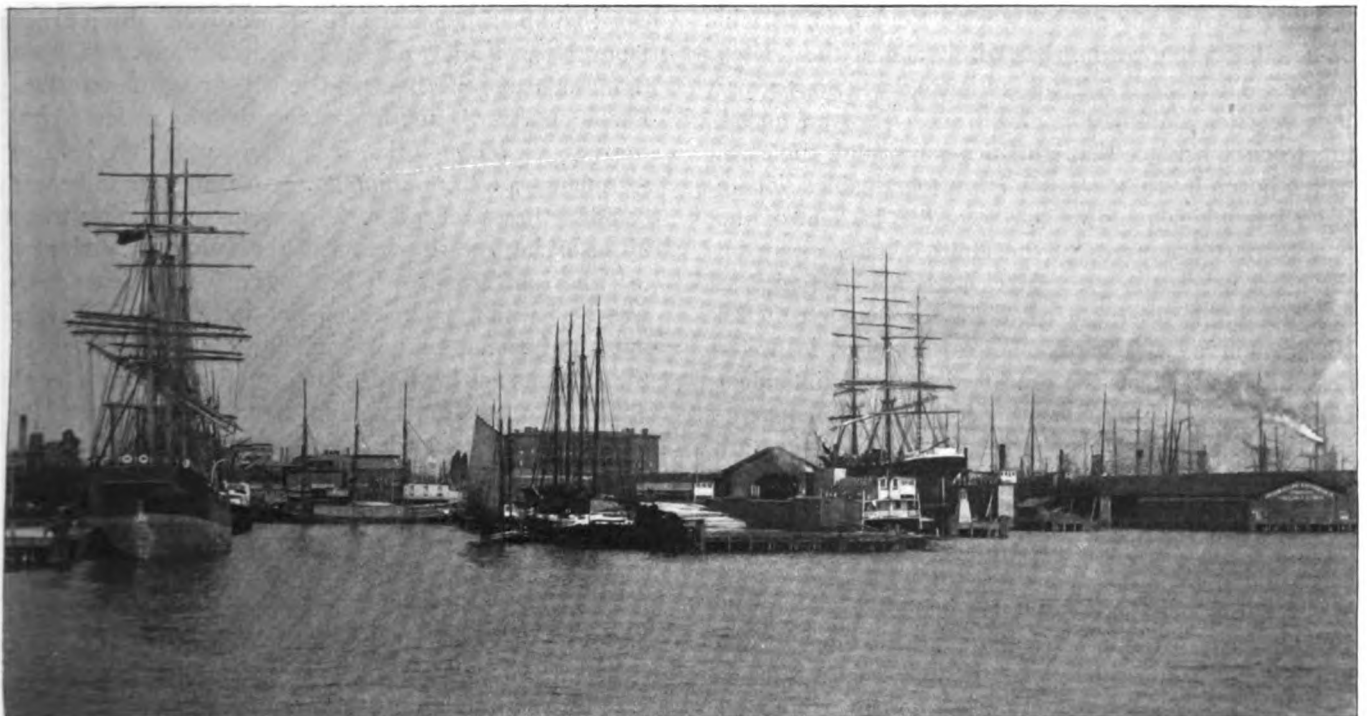
small steam craft used between San Francisco and near by points.

Nearly all these coasting vessels are built at San Francisco, Oakland (a suburb of San Francisco) and Eureka, a few being constructed on Puget Sound. For some years past there have been almost twenty new coasting vessels annually built and added to the fleet in this service.

While almost all of the coastwise trade is between domestic

merce is not very extensive in character and is not of sufficient importance to segregate from the coastwise traffic described above.

Capt. John McGee of Milwaukee has been appointed to succeed Capt. Thomas Barry temporarily on the steamer City of Fremont of the Barry Line. The Detroit inspectors of steam vessels have revoked the license of Capt. Barry for



VIEW OF PORTION OF THE WATER FRONT OF SAN FRANCISCO, SHOWING TWO SCHOONERS, ONE THREE-MASTED AND ONE FOUR-MASTED, DISCHARGING PINE LUMBER FROM THE NORTHERN COAST; ALSO A VESSEL IN DRY DOCK.

ports, some of the companies have steam schooners plying between San Francisco and Mexican ports and also to British Columbia. This trade while embraced within foreign com-

merce is not very extensive in character and is not of sufficient importance to segregate from the coastwise traffic described above. thirty days because he failed to comply with certain orders relating to the length of hose to be used for fire protection aboard the City of Fremont.



DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED  
OR ASSOCIATED WITH MARINE MATTERS  
ON THE FACE OF THE EARTH.

Published every Thursday by

**The Penton Publishing Company,**  
**CLEVELAND, OHIO.**

CLEVELAND:	WADE BUILDING.
CHICAGO:	MONADNOCK BUILDING.
DETROIT:	HAMMOND BUILDING.
NEW YORK:	150 NASSAU STREET.

*Correspondence on Marine Engineering, Ship Building and  
Shipping Subjects Solicited.*

Subscription, \$3.00 per annum. To Foreign Countries, \$4.50.  
Subscribers can have addresses changed at will.

The Cleveland News Co. will supply the trade with the **MARINE REVIEW**  
through the regular channels of the American News Co.

Entered at the Post Office at Cleveland, Ohio, as  
Second Class Matter.

SEPT. 1, 1904.

The present issue of the *Marine Review* is, as will be noted, devoted to the coastwise trade of the United States. There are vessels aggregating 5,141,037 gross tons register employed in this trade. It is an unfortunate circumstance that statistics concerning the commerce borne by these vessels is not obtainable. There is no law which requires any record to be kept of the port to port commerce of the United States either on the coast or on the great lakes and such statistics as are procurable are only of a fragmentary character. The commerce of the great lakes, however, is pretty generally gauged by the report of the superintendent of the canals at Sault Ste. Marie, but figures concerning the port to port commerce of the great lakes are purely guesswork. However, as there are vessels of over 5,000,000 tons employed in the coastwise service it follows that the business which they transact must be considerable.

Were it not for the reservation of the coasting trade to American ships there would be no ship yards in the United States. It was an act of great wisdom to reserve the coasting trade exclusively to American vessels. Without it there would be no reserve for the navy. A glance through the present issue will show that the ship yards of the United States have constructed some splendid steamships for this service. They could construct others equally as splendid for

the foreign trade if they were simply given the opportunity. No vessels are now building in the United States for the foreign trade owing to the unequal conditions under which American ships have operated in that trade. In point of fact the aggregate tonnage engaged in the foreign trade flying the American flag is only 879,264 tons and the sad circumstance about even this pitiful figure is that it shows a decline during the past decade. The merchant marine of the United States, it may be said, is wholly devoted to domestic transportation. While the tonnage employed in the coasting trade has shown the substantial increase of 1,286,344 tons during the past ten years, there is hope that the next decade will show an even greater increase. This hope is based upon excellent reasons. Two years hence the Philippine islands are to be included in the coasting trade of the United States. The orient is only 600 miles beyond the Philippines and trade with it is to be increased. Artificial as well as natural conditions contribute to make this so. The Japanese-Russian war will leave the orient in a famished state and prodigious quantities of supplies of all kinds will have to be forwarded there to replace the wastage caused by the encounter of these two nations. With the trade of the Philippines applied to American ships the commercial conquest of the orient ought to be simplified. There is reason to believe that this reservation of the Philippine trade to American ships is a more important matter than at present it appears to be.

Then, too, within the next ten years the Panama canal will be a physical fact. It will make the journey from New York to San Francisco thousands upon thousands of miles less and it will bring the western Pacific ports of South America within a few days' journey of New York. All this cannot but help to stimulate American shipping. An immediate benefit could be bestowed upon the American shipping trade by reserving the shipments of the Panama canal zone to American vessels. It is a mystery why some positive declaration upon this point is not made by the bureau of navigation. The administration has extended the customs act to the Panama canal zone whereby all goods shipped from foreign countries must pay the same duty to enter the zone that they would have to pay to enter an American city, while all goods emanating from an American port are to be admitted free. That would assuredly seem to make the Panama zone trade coastwise, but no definite announcement has yet been made upon this subject by the bureau of navigation. The moral of the coastwise trade, is of course, clear. It is the benefit of protection. The coastwise service is in a healthy state because, like all the other great industries of the country, it is protected. Were it to be excluded from the benefits of protection as is the foreign trade it would immediately languish as does the foreign trade. As it is covetous eyes are cast upon the coastwise trade and it is only by eternal



vigilance that inroads are prevented from being made upon it by foreign ships. There is a loop-hole existing at present that should be stopped. It is possible now to wreck any old foreign ship in American waters and get an American registry for her and put her in the coastwise trade provided repairs to a certain sum are made upon her. This practice has been persistently pursued for twenty years or more, so that the number of foreign-built vessels engaged in the coastwise trade is now considerable. Every case of this kind should be most vigorously investigated and the granting of American registry to wrecks should be infrequent rather than frequent.

#### AT THE HEAD OF THE LAKES.

Duluth, Aug. 30.—The biggest ship on fresh water was able to move about the Duluth-Superior harbor a few days ago without aid from tugs and the sight sent cold shivers down the backs of tugmen. The *Wolvyn* had been unloading at the Northwestern Fuel dock No. 3, on the lower harbor, Duluth side, and moved from there clear up the harbor through the two drawbridges in the upper bay, and to the Duluth, Missabe & Northern ore dock. There the ship took on a reasonably large load of ore and, again alone, went down the bay through the bridges and the Duluth channel to the canal and out into the lake. It is an unusual thing for any large ship to make these shifts without a tug.

Head of the lake coal docks are pretty well filled up, so much so, indeed, that a number of ships have been unloaded direct into cars for interior delivery. Some docks are so full that it is hard to find a place for a new cargo for shipments have not kept pace with the receipts so far this year. With the influx of wheat expected at once there will be a larger outward movement of coal.

The Barnett & Record Co. has taken a contract for an extension of the Boston Coal Dock & Wharf Co.'s coal dock in the upper bay, Duluth side, that will treble the company's capacity. The dock is now 900 ft. long, but the new extension will carry it out 1,450 ft. further. This will all be filled. The contract is the largest in sight for coal dock work at the head of the lakes this season.

One Jacob W. Mann is owner and master of the *Mary W. Mann*, a small passenger craft at Duluth. The boat has long been considered unseaworthy, but no objection was raised to its operation until after the Slocum disaster in New York. Since then official investigation resulted in an order that Capt. Mann comply with regulations before the boat should be allowed to do business. The captain proceeded to ignore this order and the customs officers began to pile up fines. When they had put fines of \$5,630 against the craft, which is not worth a fraction of that sum, they decided to do something else and tied up the vessel. It is possible that Mann will be criminally proceeded against for running a boat without a license and ignoring the orders of inspectors respecting boilers, fittings and supplies.

Last year at this time wheat was coming here in large quantities, the increase in store for the week was more than 90,000 bu. But the first cars of new wheat this year arrived in Northern Pacific yards on Monday. Samples of wheat to arrive are coming in rapidly. As a general thing this wheat is shrunken and poor and XXX grades off considerably. New barley is coming in in considerable quantity and is of excellent quality.

Duluth grain men who have been inspecting the flax crop of the northwest are looking for a better crop than was expected. John Miller, head of the John Miller Grain Co.,

has just returned and says that with half the acreage of last year there will be at least as good a flax yield as then. This might very well be the case for the yield was very disappointing throughout the country, especially in the North Dakota district where most of it is raised. The only danger to flax now is frost, for the crop is very late and may easily get caught. There are still almost 5,000,000 bus. in store here of last year's seed. Grain freights remain at 1 cent a bushel, with no one carrying anything but line boats.

#### CHICAGO GRAIN REPORT.

Chicago, Aug. 30.—Measured in total weekly movement the grain shipping responses at this quarter are closely to normal activity. The unusually depressed condition obtaining throughout last week, wherein rates were forced to  $\frac{7}{8}$  cents per bushel on corn are explainable in that the local market suffered the pressure of a considerable vessel surplus, occasioned in turn by slow ore demand.

A very fair recovery presented at outset of this week and vessels are in good demand at 1 cent basis corn for Lake Erie, Port Huron and Georgian bay with improving tendency. To Montreal via all water routing the old basis of 3 cents corn is attracting steady shipping. Liners are in market with regularity though apparently well booked in grain and package freight for next ten days. Falling off in grain prices some 10 cents per bushel in wheat and 5 cents corn, influences a better shipping tone and, reflective of the recently reported heavy country acceptances daily corn receipts are running upward of 800 cars.

Shipments of grain as summarized below for "this week," distributed about as follows: Via all rail lines of wheat 188,000 bu., corn 237,000 bu., oats 614,000 bu.; Via lake to Buffalo and other American points 209,000 bu. wheat, 1,150,000 bu. corn, 285,000 bu. oats; and via lake to Canada points 419,000 bu. corn, 100,000 bu. oats.

#### Lake and Rail Shipments—

	This week.	Last week.	Same week last year.
Wheat .....	417,550	356,212	232,645
Corn .....	1,797,738	1,567,432	2,125,926
Oats .....	993,414	1,479,517	1,278,215
	3,208,702	3,403,161	3,636,786
	Shipments since Jan. 1, 1904.		Same time last year.
Wheat .....	9,306,509		13,146,252
Corn .....	44,026,634		54,134,312
Oats .....	30,838,910		43,836,307
	84,262,143		111,116,871

#### Stocks of Grain in Elevators—

	This week.	Last week.	Same week last year.
Wheat .....	3,278,000	2,687,000	6,138,000
Corn .....	2,862,000	3,256,000	4,170,000
Oats .....	5,897,000	3,750,000	5,023,000
Rye .....	587,000	563,000	388,000
	12,564,000	10,265,000	15,719,000

The steamer *Sparta* was discovered afire around the engine room on Aug. 29, while lying at the Ohio Central coal dock at Toledo. Great difficulty was experienced in getting fire engines to the burning ship and it took two hours to control the fire. The blaze was at the stern of the ship, which was burned away almost to the water's edge. The loss is estimated at \$20,000. The *Sparta* is owned by Meyer & Mills of Port Huron and was about to take on a cargo for Racine when burned.

## FORE RIVER CONTRIBUTION.



During the past three or four years the Fore River Ship & Engine Co., Quincy, Mass., has added some splendid vessels to the coastwise fleet. Among the sailing vessels of course the novelty in the coastwise service has been the seven-masted schooner Thomas W. Lawson, of which some very excellent illustra-

tions are published in this issue. The Lawson is 403 ft. 4 in. over all, 368 ft. on the water line, 50 ft. beam, 34 ft. 5 in. deep, and her displacement loaded is 11,000 tons. Her lower masts are 135 ft. long and 31 in. diameter; her top masts are 58 ft. long, while the height of her mainmast above deck is 155 ft. Her sail spread is 43,000 sq. ft. The Lawson is fitted with a cellular bottom for carrying water ballast when sailing light. She is generally engaged in carrying coal.

The Fore River company also built the six-masted schooner William L. Douglas which has proved a very popular vessel. Her length over all is 339 ft. 6 in., length on the water line 312 ft. 3 in., breadth moulded 48 ft., depth 29 ft. 9 in. Her mean load draught is 24 ft. The Douglas is fitted with a deep tank amidship for carrying water ballast when sailing light.

The company recently turned out a splendid steamer for the coastwise service of the Old Colony Steamboat Co. This is the twin-screw, steel freight steamer Boston for service on Long Island Sound. Her dimensions are as follows: Length mould-

ed on 10-ft. water line, 291 ft. 3 in.; length over all, 318 ft.; width moulded, widest part, 60 ft. 6 in.; width over guards, widest part, 63 ft.; depth moulded at lowest place in shear, 22 ft. 6 in.

The vessel is fitted with double bottom 3 ft. deep at center, extending the length of the machinery space. The propelling machinery consists of two triple-expansion engines, having cylinders 24, 37, 63 in. diameters by 42 in. stroke, designed for a working pressure of 180 lbs. per square inch, which will drive the vessel at a speed of 19 knots per hour with an indicated horse power of approximately 5,500. Steam is generated in eight Scotch boilers 14 ft. 2½ in. diameter by 12 ft. from head to head. There is also a donkey boiler 7 ft. in diameter for supplying steam to the auxiliaries. Forced draft is supplied by two Sturtevant steel plate blowers.

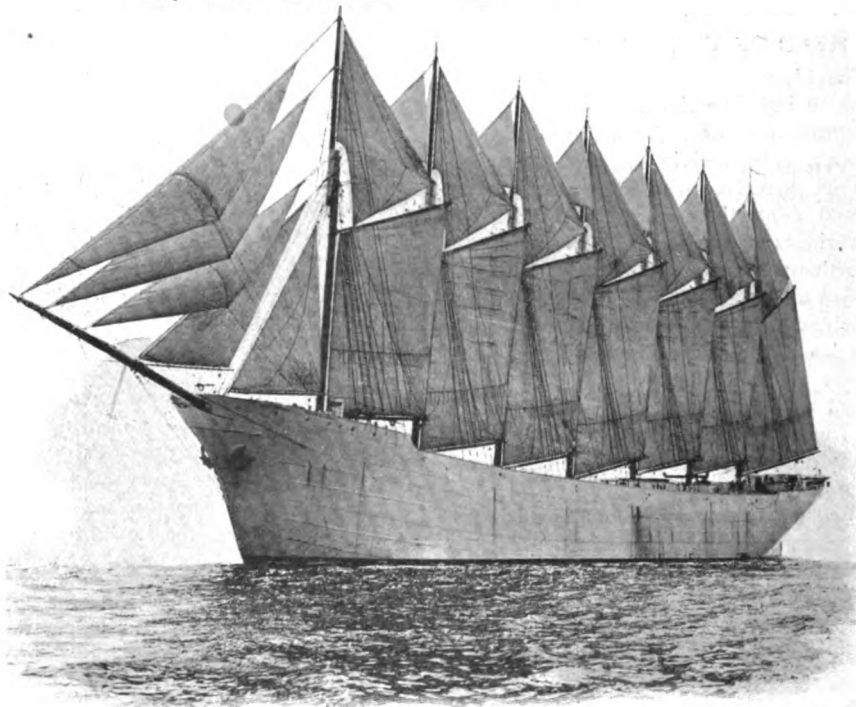
The main air pump is driven from the low pressure cross-head. The other pumps are independent and are as follows: Two 12 by 7 by 12 in. special duplex outside back plunger feed pumps; one 18½ by 12 in. by 12 in. fire and wrecking pump; one 6 by 4 by 7 duplex piston pump for sanitary and water service; one 5 by ¾ by 7 single pump donkey boiler feed; one No. 6 Cameron crank and fly wheel pump for bilge. Two 30-in. circulating

pumps. The circulating pumps are of the centrifugal type, having a 12-in. suction and 10-in. discharge, the runner being 30 in. diameter. Each pump is driven by a single vertical engine having a cylinder 7 in. by 7 in. stroke.

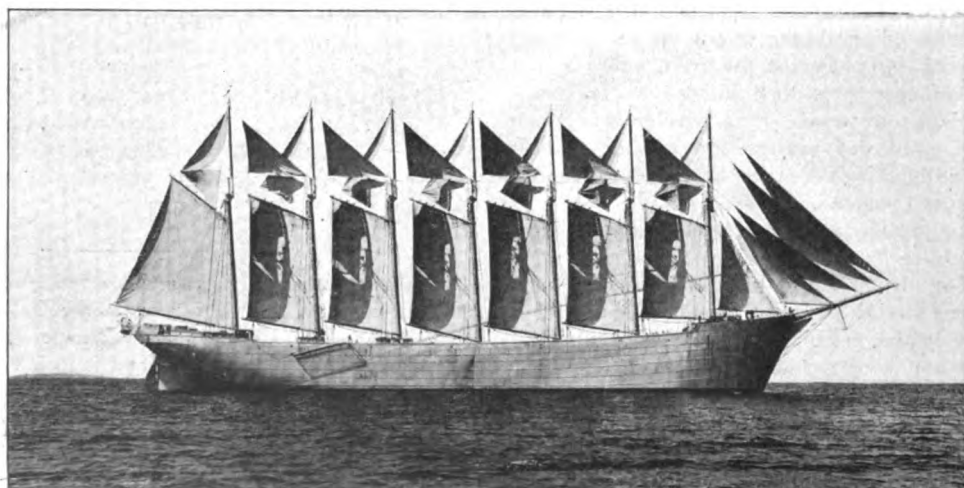
The Boston has certain improvements in design over other vessels engaged in similar service and is built under

rigid inspection. She is equipped with electric lighting, steam heating and ventilating systems. In addition to carrying freight she is provided with accommodations for forty passengers, these accommodations being first-class in all respects.

The side-wheel passenger



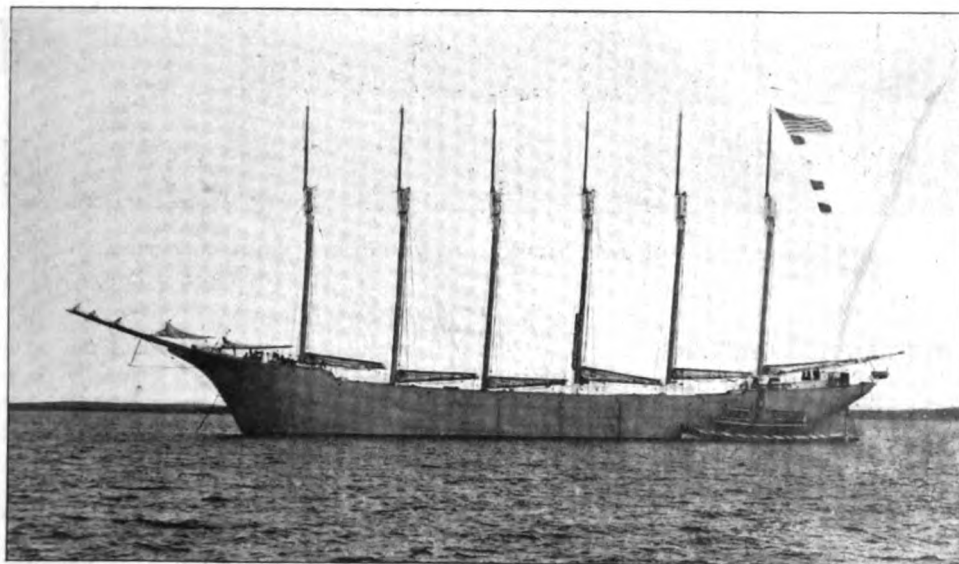
SEVEN-MASTED STEEL SCHOONER THOMAS W. LAWSON.



BROADSIDE VIEW OF SEVEN-MASTED SCHOONER THOMAS W. LAWSON.

steamer *Providence* is also under construction for the same company. Her general dimensions are: Moulded length on 12-ft. water line, 378 ft. 6 in.; length over all, 397 ft.; breadth of hull moulded at widest place, 50 ft.; breadth over guards at widest place, 88 ft.; depth moulded at lowest place in shear, 21 ft.; depth moulded at center lowest place, 21 ft., 10 in.

Her engines are double inclined compound 44 in. by 83 in. by 108 in. stroke, which will drive her at a speed of 20 miles per hour. Steam is generated in six single-ended Scotch boilers 14 ft. 6 in. diameter, 12 ft. over all. The *Providence* will not be as large as the *Priscilla* but about the same size as the *Pilgrim*.



SIX-MASTED STEEL SCHOONER WILLIAM L. DOUGLAS.

#### HAS BUILT FIVE HUNDRED VESSELS.

One of the oldest ship building companies whose work has been exclusively devoted to coastwise construction is the Robert Palmer & Sons Ship Building & Marine Railway Co. of Noank, Conn. The first vessel constructed by this company was the sloop smack *Alona* of 23 tons built by Robert Palmer in 1849, when he was twenty-four years of age. The records do not show that Mr. Palmer constructed anything further during that year, but by 1853 he had constructed the sloops *I. L. Hammond*, the *Noank*, *Welcome*, *Wm. Rice*, *G. H. Dudrows*, *E. Smith*, *Franklin Pierce*, *Moses Rogers*, *W. H. Dudley*, *G. G. King*, *Sara Clark*, *Simeon Draper*, *Comanche*, *Connecticut* and *D. N. Eldridge*. The plant has grown from small beginnings until it has now to its credit a total of forty-three sloops, forty-nine schooners, three brigs, 146 barges, seven terns, two barks, fifteen tugs, forty-six lighters, nineteen dump scows, thirty-three steamers, seven sailing yachts, four steam yachts, three pilot boats and 125 big car floats, a total of 502 vessels. The company has now under construction the schooner *Andrew J. Pierce, Jr.*, a car float for the *Starin Transportation Line*, together with three barges and six car floats. The growth of the coastwise service can be well followed in the increased dimensions of the car floats constructed by this company. Formerly they were from 160 to 180 ft. long with a capacity for eight cars; nowadays it is a common thing to build floats 316 ft. long having three tracks and a capacity for twenty-two cars. The barges, too, have been greatly increased until the proper size now is one that carries 3,300 tons with good freeboard. The schooner *Andrew J. Pierce, Jr.*, now building by the company, is a bald-headed schooner, having lower masts only and is the second of this type to be built on the Atlantic coast though the type is quite common on the Pacific coast. The company does a big business in repairs, one of its latest jobs being the repairs of the large sound steamer *City of Trenton* which recently collided with the steamer *Plymouth* and had her bow completely torn away.

Mr. Robert Palmer, the head of this company, was born on May 25, 1825, and though over seventy-nine years of age is still active not alone in his business but in a variety of other

affairs. He is chairman of the board of trustees of the Mystic and Noank library and a member of the state board of trustees of the Baptist convention of his native state. He is also trustee of the Mystic Oral School for Deaf and Dumb Mutes and while he does not let it be known he is the largest contributor to religious and charit-

able work of persons in that section of the country, giving away for this purpose every year many times more than he spends for his own living. Outside of the fishing and lobster business it may truly be said that nearly every resident of the village of Noank is connected in some way with Mr. Palmer's ship yard.

#### COASTING NOTES.

Since 1870 the Jackson & Sharp Co., Wilmington, Del., has constructed for the coasting trade seventeen steamers, ten steam barges, twenty-three tow boats, two barks, twenty-three schooners and seventy barges, ranging in tonnage from 200 to 1,800.

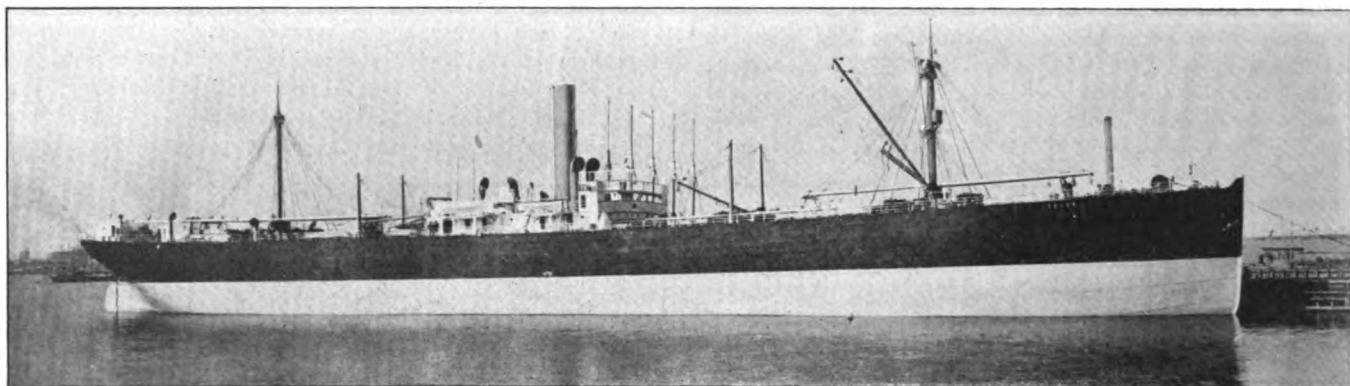
Since the discovery of oil in Texas quite a list of oil tankers have come into existence. During 1902 and 1903 the Townsend & Downey Ship Building Co., Shooter's island, New York, built for the Standard Oil Co. for the trade between Texas and New York two five-masted schooner-rigged barges 360 ft. long, 50 ft. beam and 28 ft. deep, having a capacity of about 7,000 tons deadweight.

The question of liquid fuel for use in the coasting trade has been given more attention on the Pacific coast than it has on the Atlantic. Oil has been adopted as fuel on quite a number of vessels and is constantly receiving the attention of ship builders on the Pacific coast. It is reported that the *Arizonian* and *Alaskan* of the American-Hawaiian Steamship Co's fleet operating between San Francisco, the Hawaiian islands and New York are to be equipped with liquid fuel burners. The *Nebraskan* of this fleet was the first vessel to make the long run from San Francisco to New York using oil as fuel. Several large steamers plying between San Francisco, Panama and western Pacific ports have been using oil as fuel for some time.

The Allan Line steamer *Victorian*, the largest turbine vessel yet built, was launched at the yard of Workman & Clark, Belfast, Ireland, last week. She is 540 ft. long, 60 ft. beam and 40 ft. 6 in. deep. She is to be equipped with turbines of the Parsons make, a preliminary description of which was published in the Review of July 7.

The fastest automobile boat *Standard*, winner of the Challenge cup last June, offered by the American Power Boat Association, has been sold by her owner C. C. Riotte to Price McKinney of Cleveland. She will be used at the owner's new home in the Thousand Islands. The *Standard* has made 23 miles an hour.





STEAMSHIP TEXAN OF THE AMERICAN-HAWAIIAN STEAMSHIP CO.'S FLEET.

[Built by New York Ship Building Co., Camden, N. J.]

**SOME SPLENDID COASTERS.**

While the New York Ship Building Co., Camden, N. J., has not been in existence very long it has already added some splendid steamers to the coastwise fleet. All of these vessels are of high class, three of them, the J. M. Guffey, Ligonier and Larimer are oil carriers, working between the Texas oil fields and the ports of Philadelphia and New York. They have superior accommodations for the engineers,

firemen and seamen with bathrooms for the officers and are fitted up in a manner that was not dreamed of a few years ago.

The American-Hawaiian Steamship Co.'s ships Texan, Nevada and Nebraskan which ply between California ports and Philadelphia and New York in the sugar trade are most elaborately fitted up, having refrigerating machinery, bathrooms and most comfortable kind of accommodations possible for officers and men. The latest new vessel for the coastwise service which this company has turned out is the Ontario for the Merchants' and Miners' Transportation Co. of Baltimore, Md. This company is one of the oldest in the coasting trade and the Ontario is the largest ship that the company possesses. She is a typical coaster with her side ports for handling cargo on trucks. She has most excellent accommodations with running water in every state-room, electric

light and Pullman berths. Her run occupies from thirty-six to forty hours and she is especially designed for the service she has to perform. These splendid ships are illustrated on the accompanying pages and are more specifically described below.

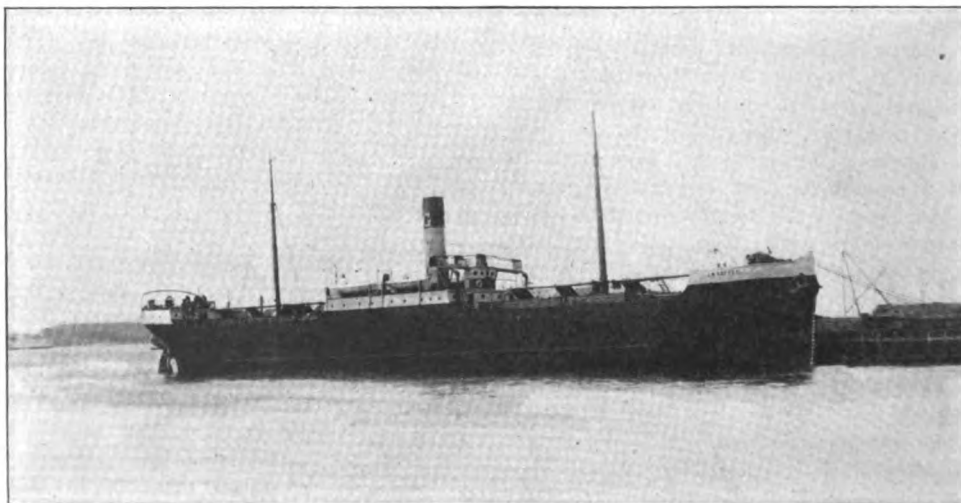
The Ontario is a single screw, steel passenger and cargo steamer of the hurricane deck type, 315 ft. long, 42 ft. beam moulded, 33 ft. 2 in. deep, and is designed for the coasting trade between Baltimore and Boston. The ship has four complete decks, orlop, lower, main and hurricane, and on the hurricane deck is a large deck house. The hold, orlop and lower decks are exclusively for cargo. On the main deck forward are accommodations for firemen and crew as well as two rooms containing berths for eighteen second-class passengers. Immediately aft is a large space devoted to cargo.

Abreast of the engine and boiler casings are the engineer's quarters, officers' mess room, galley and ice room; aft of the engine casings is another large cargo space and at the stern are the stewards' and waiters' quarters. The hurricane deck house is nicely fitted up to accommodate first-class passengers. There is a large dining saloon tastefully finished in polished mahogany, pantry, toilet rooms and forty-eight large state-rooms.

On the top of the hurricane deck house, at the forward end is the pilot house, captain's quarters and the smoking room, the latter being finished in oak. At the after end is a small observation house, connected by stairs to the main saloon. The ship is propelled by a triple-expansion engine of about 3,500 H. P., steam being supplied by two large double-ended

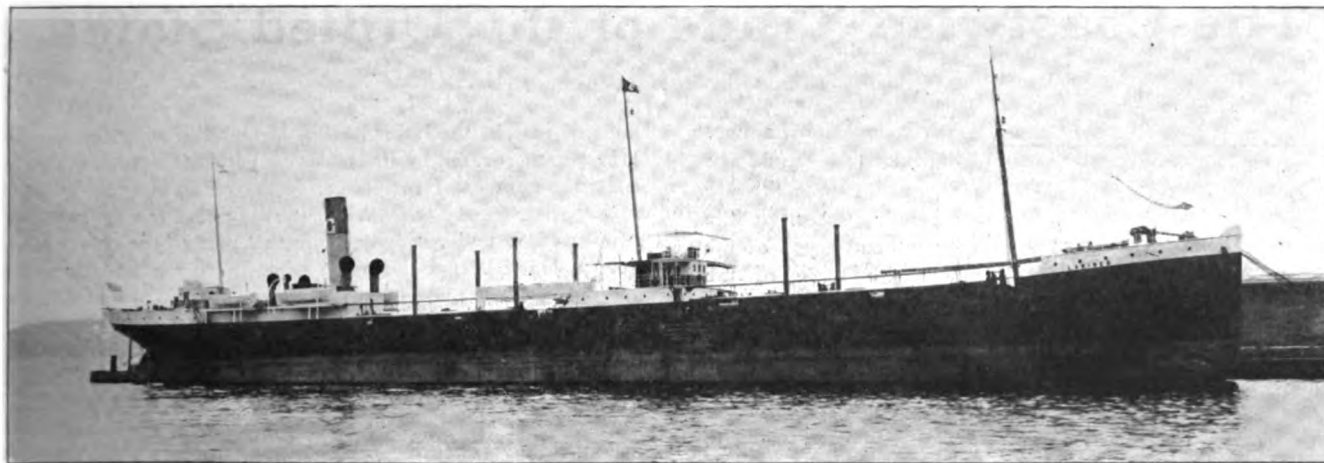
Scotch boilers.

The M. S. Dollar (now the Guffey) was built by the New York Ship Building Co. in 1901 and was single screw cargo steamer of 2,465 gross tons. The principal dimensions are as follows: length over all, 309 ft., 11 in.; beam moulded 40 ft.; depth moulded 26 ft. The ship is of the three-



STEAMER J. M. GUFFEY IN THE TEXAS OIL TRADE.

[Built by New York Ship Building Co., Camden, N. J.]



STEAMSHIP LARIMER IN THE TEXAS OIL TRADE.

*[Built by New York Ship Building Co., Camden, N. J.]*

deck type with one complete steel deck, one tier of beams, with no deck laid, and with frame in the hold. Above the upper deck are a poop, bridge and forecastle, the officers being quartered in the bridge house and the crew in the poop. There are two masts, with four cargo booms on each. The propelling machinery consists of a triple expansion engine of about 1,500 H. P. and two single-end Scotch boilers. Upon the completion of this ship she was sold to the Guffey Petroleum Co. and converted by the builders into an oil tanker.

The steamship Texan is a shelter deck cargo steamer of 8,000 gross tons and was built for the American-Hawaiian Steamship Co. by the New York Ship Building Co. in 1902. Her principal dimensions are as follows: Length over all, 484 ft. 3 in.; beam moulded, 57 ft.; depth moulded to shelter deck, 42 ft. 6 in. The ship is of the three-deck type with complete steel shelter deck and has the highest rating of Lloyd's registry. There are two short masts and four derrick posts, the entire cargo handling outfit being very complete. The officers are quartered in a steel house on the shelter deck and the crew and petty officers are housed on the upper deck aft and forward respectively.

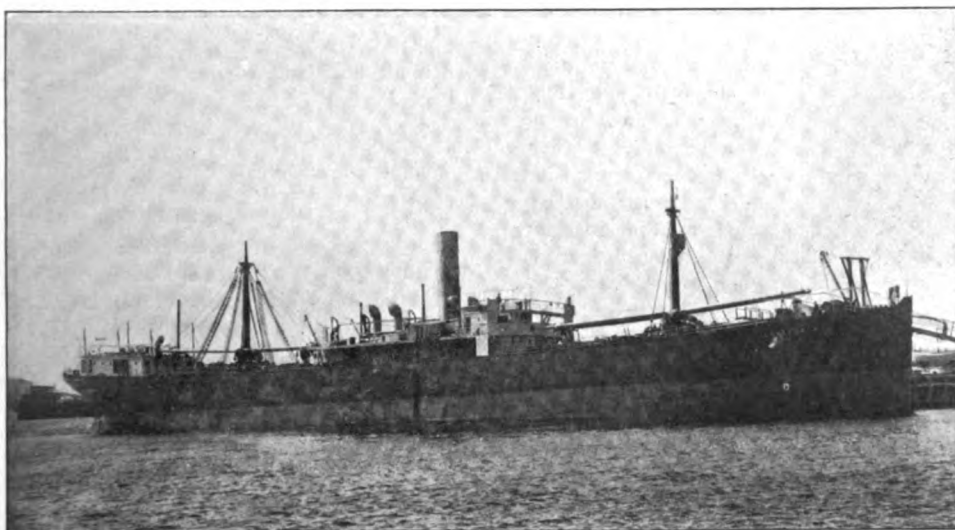
The ship is propelled by twin screws, driven by quadruple-expansion engine of about 3,500 I. H. P. There are two large single-end Scotch boilers fitted with heated forced draft and two donkey boilers. The steam pressure carried on the main boiler is 215 lbs. Electric lights are supplied throughout and there is a small refrigerating plant for ship's store. The Texan has a total deadweight capacity of over 11,000 tons and a sea speed of over 11 knots loaded.

The steamship Nevadan is a shelter deck cargo steamer of 4,408 gross tons and was built by the New York Ship Building Co. in 1902. Her principal dimensions are as follows: Length

over all, 371 ft. 6 in.; beam moulded, 46 ft.; depth moulded to shelter deck, 34 ft. 8 in.

The ship is of the three-deck type with complete shelter deck and is classed to the highest rating of Lloyd's registry. There is a cold storage plant of the ammonia system, the total volume of refrigerating spaces being about 23,000 cu. ft. There

are two short masts, each supplied with a large number of cargo booms, and the entire cargo handling arrangements are of the most complete description. The vessel is lighted throughout by electricity. The propelling machinery consists of two triple-expansion engines driving twin screws, the total indicated horse



STEAMER NEVADAN OF THE AMERICAN-HAWAIIAN STEAMSHIP CO.'S FLEET

power being about 3,000. There are two single-end Scotch boilers fitted with heated forced draft, the pressure of steam being 200 lbs. Oil fuel is used, the low-pressure air system being fitted to supply the oil to the furnaces. The officers are quartered in a large steel house on the shelter deck amidships, this house also containing rooms for eight passengers. The crew's quarters are in a large house on the shelter deck aft.

The Ligonier is a spar deck oil carrying steamer of 3,737 gross tons and was built for the Guffey Petroleum Co. by the New York Ship Building Co. in 1903. The propelling machinery is located aft, the main body of the ship being occupied by the oil tanks, which are sixteen in number, two being used for carrying oil fuel. The total volume of all tanks is about 200,000 cu. ft. Above the spar deck are a poop, bridge and forecastle, the engineers being quartered in the poop, deck officers in the bridge and crew in the forecastle. There are three masts and six derrick posts, the latter being used for handling cargo in the upper 'tween decks side of the oil trunks. The ship is propelled by a triple-expansion engine of about 2,500 I. H. P., oil fuel being used.

# The Coastwise Trade of the United States.

By ALEXANDER R. SMITH,  
Superintendent of the New York Maritime Exchange.



It is doubtful if a more difficult task could be assigned to one than to accurately describe the extent and scope of the coastwise trade of the United States. The government keeps no complete statistics of the vessels engaged in the traffic, nor does it compile any data showing the character and quantity of the merchandise carried. Necessarily, therefore, the subject must be treated more generally than specifically.

The documented vessels of the United States include three classes, namely: 1. Vessels under register, which are engaged in the foreign trade. 2. Vessels under enrollment of more than 20 tons, engaged in the domestic trade. 3. Vessels under license, and under 20 tons, also engaged in the domestic trade. What proportion of the vessels under en-

rollment are engaged in the coastwise trade it would be almost impossible to accurately state, as the vessels under this classification include all of those employed in harbor and river transportation, no distinction being made between the latter and those engaged in a strictly coastwise business. For instance: There are in the Atlantic and Gulf coast trade, coastwise and otherwise, 6,249 sail vessels of 1,502,229 gross tons under enrollment, of which but about 730 vessels, of approximately 435,500 net tons, are engaged in what may be strictly termed the coastwise trade, which shows that for every sail vessel on the coast there are eight in the harbors and rivers, and for every ton employed upon the coast there are 2½ tons in the harbors and rivers. In steam the proportion engaged in river and harbor work is probably larger than in sail.

Some general statistics of the entire documented tonnage on the Atlantic and Gulf coast, the Pacific coast and the great lakes will serve to give a comprehensive idea of the condition and growth of our domestic shipping. It is believed that these can best be presented in a series of brief tables, covering, in the first group, all vessels under enrollment, both steam and sail, for the years 1884, 1893 and 1903, and for the Atlantic and Gulf, the Pacific and the great lakes; in the second the steam vessels under enrollment, subdivided as to year and grand divisions of the United States as in the first group; and in the third group the sail vessels under enrollment similarly subdivided.

The tables show that while there has been an actual decrease in the number of enrolled vessels, between 1884 and 1903, the tonnage of the vessels has almost doubled. The decrease has been greatest on the Atlantic and Gulf coasts, but the decrease is only in the number and not in the ton-

nage of vessels, the latter having increased during the twenty year period covered by the tables 53 per cent. On the Pacific coast the number of vessels has increased 80 per cent and the tonnage increased 153 per cent, showing that the average size of the vessels under enrollment in that part of the country has nearly doubled. On the great lakes there has been a slight falling off in the number but an increase of 160 per cent in the tonnage.

## TOTAL VESSELS UNDER ENROLLMENT.

1884.		
Division.	Number.	Gross tons.
Atlantic and Gulf coasts.....	10,209	1,625,298
Pacific coast.....	712	175,545
Great Lakes.....	3,366	731,204
Total .....	14,287	2,532,047

1893.		
Atlantic and Gulf coasts.....	9,826	2,016,827
Pacific coast.....	885	261,307
Great Lakes.....	3,760	1,258,556
Total .....	14,471	3,536,690

1903.		
Atlantic and Gulf coasts.....	8,716	2,498,135
Pacific coast.....	1,286	444,432
Great Lakes.....	3,109	1,902,579
Total .....	13,111	4,845,146

## STEAM VESSELS UNDER ENROLLMENT.

1884.		
Division.	Number.	Gross tons.
Atlantic and Gulf coasts.....	1,811	608,269
Pacific coast.....	246	93,589
Great Lakes.....	1,158	322,342
Total .....	3,215	1,024,200

1893.		
Atlantic and Gulf coasts.....	2,121	744,188
Pacific coast.....	365	128,872
Great Lakes.....	1,730	826,191
Total .....	4,216	1,699,251

1903.		
Atlantic and Gulf coasts.....	2,467	995,906
Pacific coast.....	552	209,933
Great Lakes.....	1,795	1,467,873
Total .....	4,814	2,673,712

## SAIL VESSELS UNDER ENROLLMENT.

1884.		
Division.	Number	Gross tons.
Atlantic and Gulf coasts.....	8,398	1,017,029
Pacific coast.....	466	81,956
Great Lakes.....	2,208	403,863
Total .....	11,072	1,507,848

1893.		
Atlantic and Gulf Coasts.....	7,705	1,272,639
Pacific coast.....	520	167,718
Great Lakes.....	2,030	432,365
Total .....	10,255	1,872,722



Division.	1904. Number.	Gross tons.
Atlantic and Gulf coasts.....	6,249	1,502,229
Pacific coast.....	734	234,499
Great Lakes.....	1,314	434,706
Total .....	8,297	2,171,434

The increases and decreases in the total number and tonnage of all vessels while of interest, does not accurately convey the real extent of the change, without the increases and decreases in steam are the same as in sail vessels, which is not the case. The efficiency of a steam vessel has been placed, in the ocean trade, as three times greater than that of sail, but it is quite likely that this efficiency is much greater in the coastwise and domestic trade.

The table of steam vessels under enrollment shows an increase of 50 per cent in the number and of 161 per cent in tonnage for the whole United States coast and great lakes' trade. This increase has been least on the Atlantic and Gulf coasts and largest on the great lakes. There has been an increase of 36 per cent in the number and of 65 per cent in the tonnage of the Atlantic and Gulf coasts' steam vessels. The increase in the number of steam vessels on the Pacific coast conforms precisely—124 per cent—to the increase in tonnage, showing no change in the average tonnage of steam vessels under enrollment on that coast during the past twenty years. On the great lakes the increase in the size of steam vessels in twenty years has been nearly seven times greater than the increase in number, notwithstanding the increase in number has been 55 per cent. The actual increase in tonnage amounts to 356 per cent.

While twenty years ago the tonnage of steam vessels on the Atlantic and Gulf coasts was almost double that of the great lakes, the steam tonnage on our great inland seas now exceeds that of the Atlantic and Gulf coasts by 50 per cent.

In sail vessels under enrollment, the changes are not so great. There has been a decrease of 25 per cent in the number of vessels, with an increase of 30 per cent in tonnage, during the past twenty years. The decrease in the number of vessels on the Atlantic and Gulf coasts has been 25 per cent, while the increase in tonnage has been almost 50 per cent. There has been an increase of 55 per cent in the number and an increase of 180 per cent in the tonnage of sail vessels on the Pacific coast during the twenty year period covered by the tables. On the great lakes, while there has been a decrease of 40 per cent in the number there has been an increase of 6 per cent in the tonnage of sail vessels, showing that the sail tonnage on the great lakes barely holds its own, while, as has been shown, the increase in steam tonnage was 356 per cent.

Those interested in the statistical condition and changes in the vessels under enrollment will find a more detailed study of the figures presented in the tables, during the three periods of 1884, 1893 and 1903, of value. That they present a very healthy and prosperous condition is made quite manifest, and the contrast they present with our vessels under register (the latter being engaged in the foreign trade) is most marked and significant.

On the Atlantic and Gulf coasts of the United States great lines of steamships and a number of lines of steamboats do the larger part of the carrying, the frequency and regularity of their voyages giving them a grasp upon the trade which they are constantly increasing at the expense of the sail vessel interest. In the case of steam traffic as well as in the case of sail the effects of organization and the effects of the lack of organization are marked with broad and distinct lines. This is more manifest to those engaged in the trade than it would be possible to demonstrate to one unfamiliar with it, because of the lack of statistical data, already explained. Of the 730 sail vessels employed on the Atlantic and Gulf coasts, they

range in tonnage from about 100 up to 5,000 and are entirely composed of schooners. While the statistics are obtainable, the compilation of them would require more research and time than the writer has had available, to show the changes that have occurred during the past twenty years in the number and tonnage of our sail and steam vessels that are engaged in a strictly coastwise business. As to sail vessels it may be said that there has been a great decrease in number and a considerable decrease in tonnage, while as to steam vessels there has been a large increase in both number and tonnage, the latter, however, greatly exceeding the former.

The last census of the waterborne commerce of the United States was taken in 1889, fifteen years ago. While very complete, detailed and elaborate, its subdivisions do not permit of an accurate separation of the coastwise from the foreign-going marine, nor is the shipping of our harbors separately stated. There is much in the report, however, of great value and it is much to be regretted that the census bureau has failed to have any new census taken during the past five years. It is equally regrettable that the census bureau cannot be induced to set a definite time when a new official compilation of the statistics of our waterborne commerce can be expected.

One feature of the coastwise trade of the United States, which trade is probably only in its inception, considering the possibilities and probabilities of its increase under the impetus of the constructed Panama canal, that should at all times be jealously guarded, is its exclusive reservation for American-built vessels. With the growth of our population, with the increase in the interchange of products between our own people, we have, admittedly to a limited extent, but nevertheless of priceless value, a nursery for our seamen, and a resource for our ship building industry. It is remarkable that our statesmen can look upon our prosperous protected coastwise trade, and not realize that our unprosperous, shrinking and declining shipping in the foreign trade only requires the same encouragement and assistance from the government to enable it to grow and expand equally with our domestic shipping. It is hoped, and it is believed, however, that the time is near at hand when the government will come to the aid and protection of our shipping in the foreign trade, to which it is a happy augury, both of the great political parties are pledged this year by their platform pronouncements.

Were American ships, instead of foreign ships, engaged in doing our foreign carrying, it would be possible to double the statistics of tonnage and of capital invested in shipping, that have already been presented in this article. That is to say we would exceed Great Britain in our total tonnage and its value would probably exceed that of any other nation on earth. Surely this is an accomplishment for all good American citizens to look forward to, and to industriously and unceasingly work for.

But little is needed of the nation for the encouragement and advancement of our coastwise shipping—everything is still required for the advancement and safeguarding of our shipping in the foreign trade.

Horace See, New York, engineer and naval architect, presented on Aug. 25 to New York State Engineer Van Alstyne his report on the type of boat best adapted to the 1,000-ton barge canal. Mr. See has prepared a design for a barge 150 ft. long and 27 ft. wide under 10 ft. draught that will carry 1,020 tons of wheat. The type is such that the midship section and form of ends are best suited for carrying the load without damage to the canal or vessel as well as for the movement of the barges with the least resistance in the water.

The Alaska Steamship Co. will equip its steamers Dolphin and Rosalie with oil burners. The Commercial Street Boiler Works of Seattle, Wash., will build the tanks.

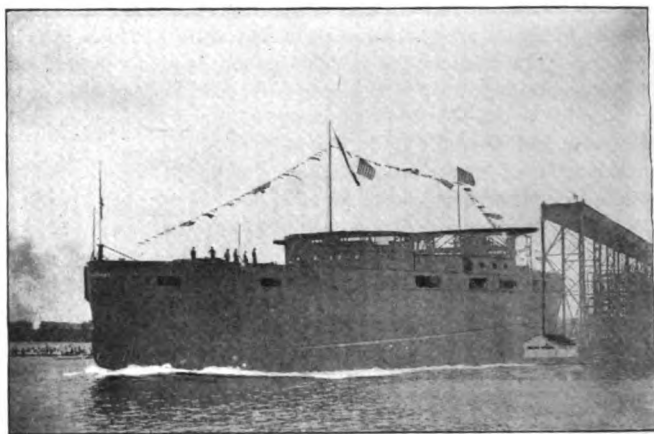
### LAUNCH OF BATTLESHIP LOUISIANA.



MISS JUNIATA LALLANDE

The battleship Louisiana was launched from the yard of the Newport News Ship Building & Dry Dock Co., Newport News, Va., on Saturday last. Its sister ship Connecticut, building at the New York navy yard, will be launched on Sept. 29, so that the Louisiana is fully a month ahead of the Connecticut. The new battleship was named by Miss Juniata Lallande of New Orleans. Governor Blanchard of New Orleans was unable to be present and was represented by Lieut. Gov. J. Y. Saunders. Gov. A. J. Montague of Virginia, accompanied by his staff, arrived early in the day from Richmond. The navy department was represented by Rear Admiral Harrington, commanding the navy yard at Norfolk, and a number of officials from Washington. The Louisiana was 54 per cent completed as she went over. Thousands upon thousands witnessed the launch and the great battleship was royally cheered. President C. B. Orcott and Supt. W. A. Post of the ship building company headed the naming party. Miss Lallande was assisted by Miss Alice Stauffer, first maid of honor, Miss Margot Castellano, second maid of honor, and Miss Ruby Lallande, her sister. Miss Lallande broke the bottle at the first sign of movement and christened the ship very well indeed. The launch was successful in every way, the battleship striking the water with considerable momentum. She buried her stern well above the water line, rose aft, gracefully dipped her stem

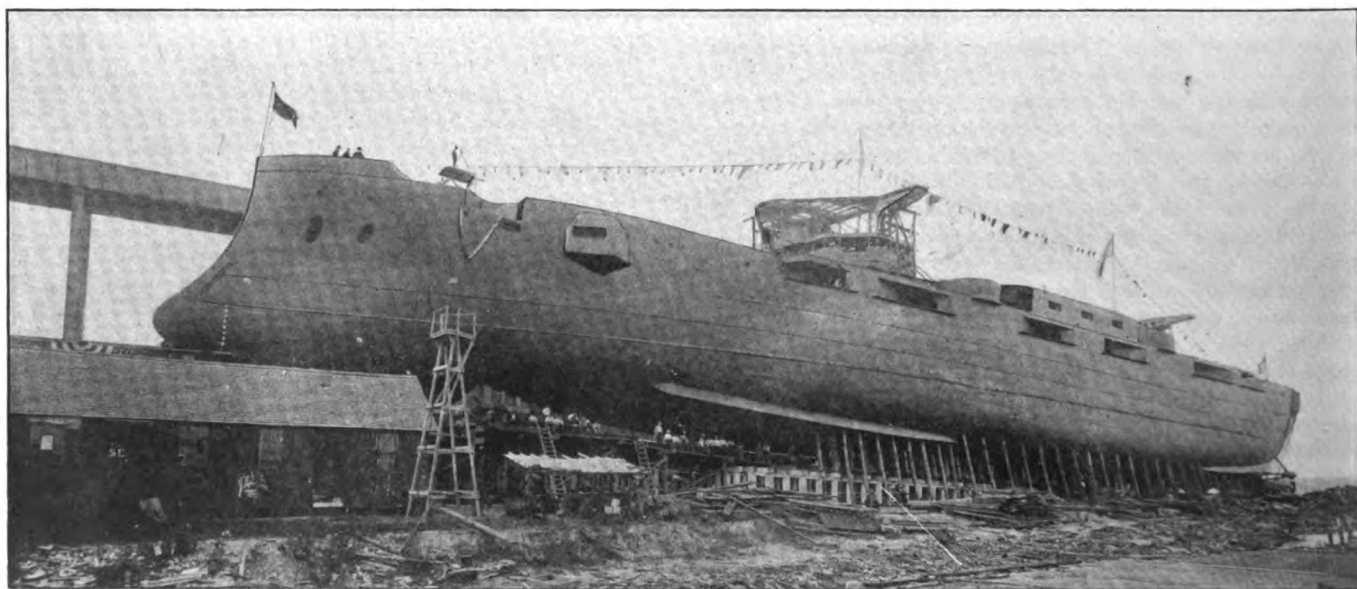
triple-expansion direct-acting, engines, designed for 16,500 collective horse power at 120 revolutions a minute. Each engine will be placed in a separate watertight compartment, and will have cylinders  $32\frac{1}{2}$  in., 53 in. and two 61 in. in diameter, by 48 in. stroke of piston. Steam at 265 lbs. pressure will be supplied from twelve boilers of the Babcock & Wilcox type, placed in six watertight compartments. The total grate surface of the twelve boilers will be 1,100 sq. ft., and the total



THE LOUISIANA TAKING THE PLUNGE.

heating surface will be 52,750 sq. ft. The smoke-pipes will be three in number, standing fore and aft.

There will be a complete water line belt 9 ft. 3 in. wide amidships and stepped down at the ends. In wake of machinery spaces the armor will be 11 in. thick at the top, tapering to 9 in. at the bottom. Forward and aft the armor will step down to 9 in. at the top and 7 in. at the bottom, then to 7 in. at the top and 5 in. at the bottom, then to 5 in. constant thickness, then to 4 in. constant thickness. There will be lower



THE LOUISIANA AS SHE APPEARED JUST PRIOR TO HER LAUNCHING.

and then settled upon an even keel amid the shriek of whistles and the cheers of spectators.

The dimensions of the Louisiana are as follows: Length on load water line, 450 ft.; beam, extreme, to outside of plating, 76 ft. 8 in.; draught, on normal displacement of 16,000 tons, 24 ft. 6 in.; designed indicated horse power, 16,500; speed, 18 knots; complement of officers, 41; complement of seamen, marines, etc., 778. There will be two sets of vertical, inverted,

casemate armor 6 in. thick and upper casemate armor 7 in. thick. The 12-in. turret armor will be 12 in. thick on the port plates, 8 in. thick on the sides and back; the 8-in. turret armor will be  $6\frac{1}{2}$  in. thick on the port plates and 6 in. thick on the sides and back.

The main battery will consist of four 12-in. breechloading rifles, mounted in two turrets, one forward and one aft; eight 8-in. breechloading rifles mounted in four side turrets. There

will be a secondary battery of twenty 3-in. (14-pounder) rapid-fire guns of 50 calibres in length, twelve 3-pounder semi-automatic guns, six 1-pounder automatic guns, two 1-pounder semi-automatic guns, two 3-in. field pieces, two machine guns of .30 calibre and six automatic guns of .30 calibre. There will also be four 21-in. submerged torpedo tubes.

### FREIGHT SITUATION ON THE LAKES.

Trade conditions could not be more discouraging than they are at present on the great lakes. Upper lake docks are congested with coal so that it is impossible for some of them to receive a single cargo directly. Vessels are unloading into cars and dispatch is consequently slow. While considerable ore is moving it is not sufficient to even keep contract tonnage reasonably well employed. While August shipments have not yet been compiled they will probably fall below those of July. The wild rate on ore from Marquette was cut 5 cents last week but owners are not taking kindly to it and not much wild ore is being placed at 55 cents. The grain trade shows a slight improvement.

### AROUND THE GREAT LAKES.

The barge Maida, laden with ore, grounded at Lorain the week of Aug. 26.

The steamer Georgia ran into and tore up about 20 ft. of the Goodrich dock at Sturgeon bay on Aug. 24 when attempting to make a landing.

The schooner Polinasia, in tow of the steamer Italia, went aground at Portage entry the week of Aug. 26 with a cargo of 7,000 tons of coal.

William Stevens, a deckhand on the schooner Jenness, fell from a 20-ft. lumber pile on Scribner's dock at Tonawanda on Aug. 23 and was seriously injured.

John Kelley, a laborer engaged in stowing salt on the propeller Wyoming at Marine City, was badly injured Aug. 24 by a barrel which slipped from the hooks.

The new steamer to be built at Cleveland for the Anchor Line will have engines to be exact duplicates of those of the Tionesta. The engines will be built by the Detroit Ship Building Co.

After loading 6,300 tons of iron ore at the No. 4 dock, Marquette, Mich., the steamer Queen City was found to be resting on the bottom and it was a full day before she was released by a tug.

The Cuyahoga Contracting Co. has made a proposition to the city of Port Huron to complete the canal from the junction of Black river to Lake Huron under the terms of the original contract.

The tug H. B. Phillips is now at Amherstburg, Ont., to assist consort over the Linckiln crossing and to work at wrecking with the assistance of the lighter Newman and wrecker Saginaw.

The stern-wheel steamer Fashion of Oshkosh has been sold to John Velte of Oshkosh, and Fred Thompson of Berlin, by Carl Wagner of Fond du Lac. Capt. John Velte will remain in command.

Maj. W. L. Fisk, corps of engineers, reports that the United States lake survey steamer Search has found a new shoal in the northern end of Green bay. It is 2½ miles from the Eleven Foot Shoal light vessel No. 60.

On Aug. 25, while leaving Saugatuck harbor, the steamer Saugatuck ran on the outer harbor bar outside the entrance. The life-saving crew took away the passengers of the boat and they afterward took the Holland for Chicago.

The large Antrim, while bound up the river at Cleveland, struck the Baltic at the Irishtown coal dock, parting the latter's mooring lines. The Baltic dropped down river, fouling the coal chute and carrying away her foremast and maintopmast.

The propeller Jim Sheriffs on Aug. 25 was obliged to drop the barge James Mowatt 12 miles from Cleveland. The barge, bound up the lake from Tonawanda, dropped her anchors and was picked up later by the tug Frank and towed to Cleveland.

Under the joint influence of wind and current the passenger steamer Tionesta of the Anchor Line collided with the end of the Northern Pacific dock No. 4 at Duluth, last week. The dock was damaged to the extent of \$1,000 but the steamer was not injured.

Naval Architect W. J. Wood is designing another fire-boat for the city of Milwaukee. The plans call for a steel tug 106 ft. over all, 95 ft. keel and 23 ft. beam. She is to be especially adapted for crushing ice. Bids will be asked for in about ninety days.

At Duluth the government is putting life preservers on the piers at the local ship canal. There will be three on each pier placed in boxes. The boxes will be bolted to the pier and arranged so they can be opened instantly. The preservers will be of the ring variety.

The reef upon which the steamer J. T. Hutchinson grounded on the night of Nov. 29, 1903, is situated 4.8 miles from Eagle River light and 0.43 miles from shore. It extends 200 ft. in a northeast and southwest direction and is 60 ft. wide, with a least depth of 14 ft., surrounded by depths of 20 ft.

The Canadian government has erected a lighthouse on the pier near the northern end of the shoals of St. Rock. The light was put in operation Aug. 10. The lighthouse is a rectangular building with concrete walls and mansard roof and from its base to the vane on the lantern it is 50 ft. high.

The steamer Walter Vail, of H. T. Pauley's fleet, is to be cut down to a lumber carrier this fall. The Vail was built in 1890 at West Bay City. She will be one of the largest lumber carriers on the lakes when her upper decks and part of her bulwarks have been removed and will load more than 1,000,000 ft. The Vail is 200 ft. long and 35 ft. beam.

Frederick M. Steele, a Chicago railroad man, began suit Aug. 26 for an injunction against the Graham & Morton Line to restrain that company from widening the canal basin at St. Joseph, Mich. Last spring the transportation company let a contract for \$10,000 for improvements on the Benton Harbor canal to accommodate the new steamer City of Benton Harbor. An agreement was made with Steele, who owns the adjoining property, but he alleges the delay in completing the work has rendered the contract void. He now wants to utilize the land for building purposes.

The United States court of appeals has just affirmed a decree of Judge Hazel of the Buffalo district in the collision case of the schooner John Martin and the steamer Yuma in St. Clair river four years ago. Judge Hazel holds each vessel equally at fault and the higher courts sustain him. The circumstances are these: On Sept. 21, 1900, the Martin was bound down in tow of the steamer M. B. Grover and when she was just entering St. Clair river the Yuma came along, bound up. The wreck of the barge Fontana obstructed navigation to some extent and while the Yuma passed the Grover all right she swerved and collided with the Martin. The latter went to the bottom immediately, drowning four of her crew, including the captain and mate. The Martin, including her cargo of iron ore, was a total loss. M. A. Bradley of Cleveland, managing owner of the Martin, filed a libel against the Yuma, claiming about \$30,000 damages. The Wilson Transit Co., owners of the Yuma, filed a cross-bill charging the Martin with the collision and claiming damages to the extent of \$5,000. The court holds that both the Yuma and Martin were at fault, the former sheering to starboard just prior to the collision and the latter for not following her steamer and for being too far to the westward of the steamer's course.



## ITEMS OF GENERAL INTEREST.

The steamer Jubilee, running on lake Temiskaming, Ont., ran into the wharf at Haileybury, Ont., recently and sank during the night.

The three-masted schooner Samuel S. Thorp, Capt. Pierce, will undergo extensive repairs at Newport News. She was damaged on a trip down the coast recently.

The schooner Augustus A. Babcock will be launched from the yard of E. & I. K. Stetson, Brewer, Me., Sept. 10. She will go over fully rigged and nearly ready for sea.

G. Knight has secured a site on the Red river at Winnipeg for a yard for the construction of motor launches. Two launches have already been built for Winnipeg owners.

The five-masted schooner Jane Palmer, the largest five-masted schooner ever built, was successfully launched last week from the ship yard of Wm. McKie, East Boston, Mass.

Mr. C. B. Alexander of the New York Yacht Club has purchased the steam yacht Surf, built at Leith, in 1902, from Mr. F. D. Lambert, which he has had under American charter for some time.

A new schooner-rigged screw steamer named Everglade has just been completed at Jensen, Fla., for Robert M. Thompson of New York. She is 111 ft. long, 23 ft. beam and 4 ft. depth of hold. She is 257 gross tons.

The new yacht Grace R., built at Ford's Ship Yard, Borden-town, N. J., was launched July 24. She was christened by Miss Grace Reeder, daughter of Horace G. Reeder the owner. The vessel is 70 ft. long and 11 ft. 3 in. beam.

Frederick S. Nock, naval architect and builder, East Greenwich, R. I., reports that he is building a boat for the Buffalo Gasoline Motor Co., Buffalo, N. Y. The boat will be 40 ft. over all and will be equipped with a Buffalo motor.

A new company, the Central Power Manufacturing Co., has been formed at Albany, N. Y., to secure the canal towing equipment contract of the Erie canal. The charter permits it to manufacture electrical apparatus and distribute power.

Renewed efforts for the establishment of a steamship line between Philadelphia and New Orleans have so far progressed that an announcement that at last definite results have been achieved is expected before the end of the summer.

The United States steel sailing ship Cumberland, which was built by the government at the Charleston navy yard for training purposes, was launched last week. The ship was named by Miss Pauline Morton, daughter of the secretary of the navy.

Phil. R. Blaisdell, designer of fast auto boats, of Bath, Me., recently launched a new boat for Mayor Hyde of that city. The boat is 30 ft. long. A 20-H. P. Mohler-Degress motor is installed in the forward compartment and the pace is 18 miles an hour.

The Spedden Ship Building Co. has been awarded a contract to build a steel boiler for the Baltimore & Ohio railroad tug Convoy, one of the company's Philadelphia harbor tugs. It is to be 9 ft. 4 in. in diameter and 12 ft. long, with two furnaces.

The torpedo boat Goldborough has been relaunched at the Bremerton navy yard. This boat has been most unfortunate. In every trial during the past four years she has never come up to the government test. Something has always happened to her.

Judge Lowell of the United States district court holds the tug Nottingham and Central railroad of New Jersey barge No. 7 of New York liable for the loss of schooner Levi Hart and her cargo of coal in collision near Pollock Rip lightship on April 20 last.

The Jackson & Sharp plant of the American Car and Foundry Co. at Wilmington, Del., has on the ways five vessels, three of which are wooden hull tugboats and the

other two large barges. The company is about to construct two other barges.

A new three-masted schooner was launched from Wm. E. Woddall & Co.'s ship yard, Baltimore, on July 26. She is for sale by the builders and is especially designed for the demands of shallow water, having a capacity for 350 tons dead weight cargo.

The directors of the Niagara, Lockport & Ontario Power Co. have voted to authorize the issue of a mortgage of \$24,000,000 upon the company's corporate property to secure a like issue of bonds. This is preliminary to the construction of the Lockport Power canal.

Proposals for the furnishing of a steel, single-screw tug boat of from 200 to 250 I. H. P. for the dredging plant of Havana, Cuba, will be received at the arsenal of Havana until Oct. 15, 1904, Jose Pujalo, chief engineer of works of port of Havana, Cuba.

Howard's Ship Yard, Jeffersonville, Ind., has just finished the steamer Coppee for Capt. Arthur Hider, United States engineer. The Coppee is 140 ft. long, 30 ft. beam and 6 ft. deep. She is intended to be used in the government service in the Mississippi river.

The Lenape, a sea-going tug, was launched the week of Aug. 6 by John H. Dialogue & Son, Camden, for the Philadelphia & Reading Railway Co. The tug is the tenth of a fleet to be built to handle coal shipments between Port Richmond and New England ports.

Details are being arranged for the launching of the semi-armored cruiser Milwaukee at San Francisco in September. The mayor of Milwaukee will probably select a young woman for the christening of the ship, and the leading citizens of the city will be represented.

Alice B. Wells, daughter of Edgar T. Wells of Hartford, Conn., granddaughter of Gideon Wells, secretary of the navy from 1861 to 1869, has been selected by Governor Chamberlain of Connecticut to launch the new battleship Connecticut at the New York navy yard Sept. 27.

The Ollinger & Bruce Dry Dock Co. lately launched at Pinto Island, near Mobile, a schooner 170 ft. long, 36 ft. beam and 10 ft. depth of hold for the Mahogany Lumber & Transportation Co. The schooner will engage in the lumber trade between Mobile and Mexican plants.

The three-masted schooner City of Baltimore has been sold to Port Tampa parties by Capt. L. S. Tames. She was built at Bath, Me., in 1884 for the late Emerson Rocks. The City of Baltimore is 138 ft. long, 33 ft. 4 in. beam and 9 ft. 9 in. deep. Her gross tonnage is 365; net, 297.

Six new schooner barges, 200 ft. long, are being built at Jacksonville, Fla., for the Cook Cumber Steamship Co. to ply between Philadelphia and Jacksonville in the lumber carrying trade. Two of the barges have been launched. A tug named the Wellington is being built to tow the barges.

The Standard Oil tank steamship Capt. A. F. Lucas, which was under construction by the Trigg ship yard at Richmond, Va., when it failed, will be completed by the Delaware River Iron Ship & Engine Building Co., Chester, Pa. The Lucas will be one of the largest oil ships ever built in this country.

A new plan for the reorganization of the Pacific Packing & Navigation Co. has been completed which includes the withdrawal of the stock of the old company and the formation of a new concern with a capital stock of \$2,000,000, of which amount \$500,000 is to be preferred and the remainder common stock.

Capt. Milton Thwing, now master of the passenger steamer Santa Clara, on the northern Pacific coast, is to receive the position of master of the new steamer Harold Dollar, launched on Aug. 12 at Eureka for the Dollar Steamship Co. The new vessel is 196.8 ft. long, with a breadth of 39.2 ft. and

depth of 16.7 ft. and has a capacity for 1,000,000 ft. of lumber.

The gunboat Dubuque was launched from the yard of the Gas Engine & Power Co. and Charles L. Seabury & Co., (consolidated), Morris Height, N. Y., this week. She was named by Miss Margaret Treadway. The Dubuque is 200 ft. over all, 174 ft. on the load water line, 35 ft. beam and 22 ft. 9 in. deep.

The Puget Sound Navigation Co., owners of the steamer Clallam, which sank during a storm in the straits of Juan de Fuca on Feb. 9, with forty-two passengers and ten of her crew, has been relieved of liability for damages on account of the accident by United States District Judge C. B. Beltinger at Portland, Ore.

Capt. Pugsley, assistant United States inspector of hulls at Philadelphia, has been transferred to New York for duty. No one has yet been assigned to fill the vacancy caused by the transfer. Charles E. Nichols has been appointed clerk to the inspectors to succeed John McKernan, resigned. Mr. Nichols is from New London, Conn.

Announcement has been made at Montreal, Que., that the Allan Steamship Co. will have a fleet operating on the Pacific ocean when the Grand Trunk Pacific Line is in operation. The plan is to operate the Pacific fleet in conjunction with the Grand Trunk Pacific, and to run service from the Pacific terminal of the railway to different ports in Japan and China and possibly to Australia.

The new steamship Ontario, the latest addition to the Merchants' & Miners' Transportation Co., Baltimore, Md., underwent an inspection trip last week. She is a single screw steel freight and passenger steamship, 315 ft. long, 42 ft. beam and 34 ft. deep. She has triple expansion engines of 4,000 H. P. and double ended boilers. Her speed is 16 knots. Her equipment is modern throughout.

The Vineyard Ship Building Co. of Milford, Del., has contracted with the Milford & Philadelphia Steamboat Co. to build a wooden freight and passenger steamboat to ply between Philadelphia and Melford. She will be 112 ft. long, 22 ft. beam and 7 ft. depth of hold. The same firm has also contracted to build a 300-ton lighter for the Repauno Chemical Co. to be used in river and harbor work.

Contractor James MacMahon has a contract on the preliminary work to the erection of a lighthouse on Mile Rock, in San Francisco bay. The preliminary work will cost about \$30,000. The lighthouse, when completed, will cost at least \$200,000 more. It is to be a steel structure, the light being 84 ft. above the water and a steam whistle for use in thick weather is also to be a part of the equipment.

The Hampton Roads Boat Building Co., Newport News, has now under construction a gasoline launch for the Virginia Pilots' association and also a yawl boat. The company has under construction a gasoline launch for a resident of Newport News. The Hopkins Boat Building Co. is comparatively a new firm and is located at the foot of Thirty-first street, Newport News, just south of Finch's pier.

The need of better docking facilities at the New York navy yard has been taken up by Secretary Morton who has practically decided to ask congress to authorize a radical increase in the capacity of the yard. It is the secretary's purpose to provide twelve new slips adequate to the use of the large battle-ships and cruisers in the navy. The improvement will call for an outlay of about \$1,200,000.

The bureau of navigation has granted American registry to the foreign built steamship Parkgate on the application of Mr. Ernest M. Bull. The steamer's American name will be Carolyn. Evidence was furnished that the vessel was wrecked in the United States in 1903 and was salvaged and repaired at a cost aggregating \$48,366.69. Registry is granted under the law which provides that when the repairs made in the United

States equal three-fourths of the cost of the vessel she may be admitted to American register.

At a meeting of the Anchor Steamship Co. July 26, in London, the chairman informed the shareholders that the year had been one of the worst on record and that he could see no signs of improvement. Referring to the Atlantic rate war, he declared that the recent conferences had proved unsuccessful because all the interests involved had not been represented at them. The conferences will be resumed at Hamburg about the middle of September.

A committee of the State Barge Canal Association of New York held a conference at Albany, Aug. 23, with the members of the barge canal board of advisory engineers, relative to the date when the work on the proposed waterway will be inaugurated. Plans have been submitted to the canal board for work which will cost in the neighborhood of \$4,000,000 and plans for additional work to cost \$5,000,000 will be submitted within a few weeks.

The Eastern Steamship Co.'s steamer City of Rockland, bound from Boston for Penobscot river ports, struck on Gangway Ledge in Penobscot bay on July 26 and was badly damaged. She is one of the largest and finest steamers owned by the Eastern Steamship Co. She was built in East Boston, Mass., in 1901. She is valued at \$300,000. Her length is 274.3 ft., beam 38.5 ft. and depth 14.4 ft. Her net tonnage is 1,025 and her gross tonnage is 1,696.

In the year ending June 1, 1904, there were launched from Maine yards twenty-seven schooners, ranging in size from 275 to 3,065 gross tons, a total of 29,713 tons. The fleet now in process of construction, under contract or launched since June 1, this year, exclusive of the battleship Georgia, at Bath, and a lot of small craft at various places, comprises twenty-seven schooners and barges, ranging from 300 to 3,000 tons gross, with an aggregate of 35,160 tons.

The accounts of the Manchester Ship Canal Co. for the half-year ended June 30, show that the total profit was £92,877. Imports of cotton fell off to the extent of 110,650 bales in comparison with the first half of last year, owing to spinners ceasing to import when prices became prohibitory. In the circumstances, the directors consider it encouraging to be able to report an increase of 54,266 tons in the weight of sea-bourne merchandise, and of £9,126 in ship canal receipts.

Rear Admiral John Crittenden Watson, who retired for age this week, is one of the civil war veterans. He is a native of Kentucky and graduated from the naval academy in 1860. He served on the Hartford from 1862 to 1864, taking part in all the famous operations of that vessel. He was wounded in Mobile bay in 1864. He became lieutenant-commander in 1866, commander in 1874, captain in 1887, commodore in 1897, and rear-admiral in 1899. During the war with Spain he commanded a division of the North Atlantic squadron, and later took command of the Asiatic squadron. He is, next to Admiral Dewey, the senior officer of the navy.

The completion of the Galveston sea wall, the greatest structure of its kind in the world, was celebrated this week at Galveston. Governor Lanham of Texas made the principal address. The completion of this wall makes Galveston the nearest port to the new Panama canal zone and a natural outlet for a considerable part of commerce of the southern states. The wall represents one of the finest pieces of engineering work of its kind in America. It is 17,593 ft. long, 16 ft. wide at the base, 5 ft. wide at the top and stands 17 ft. above mean low tide, with a granite rip rap apron extending 27 ft. out in the gulf. The contract price of the wall was \$1,198,318.

The steamer Minnesota, which has just been completed at the yard of the Eastern Ship Building Co. for the Great Northern Steamship Co. and which is the largest steamer ever constructed in the United States, was on exhibition this week at Pier 38, North River, New York. The Minnesota is one

of the two steamships built by J. J. Hill for the Pacific trade. Her sister ship, the *Dakota*, was launched last winter and is now nearing completion. Each vessel has a deadweight carrying capacity of 28,000 tons and although built for freight will have ample passenger accommodations. Thousands saw the *Minnesota* in New York and she was universally admired.

New York's fire boat equipment has recently been increased by two \$180,000 boats, the *Abraham S. Hewitt* and the *George B. McClellan*. The *McClellan* has a length over all of 116 ft.; perpendicular, 100 ft.; breadth, 25 ft.; depth, 13 ft. 8 in. She is provided with two cylinder compound engines; high-pressure cylinder, 17 in. in diameter; low pressure cylinder, 34 in.; stroke, 24 in.; two single-end Scotch boilers, 10.9 ft. diameter; two vertical duplex fly-wheel pumps, two 7-in. steam cylinders, two 10-in. pumps, 11-in. stroke; one pump of same design, with two 9-in. steam cylinders and two 5½-in. pumps, 8-in. stroke. There are three monitor nozzles on each boat. Both fire boats were constructed by the New York Ship Building Co. of Camden, N. J. The *George B. McClellan* was designed by Tams, Lemoine & Crane of 52 Pine street, New York.

The war between the steamship lines engaged in the Atlantic passenger trade is now on with a vengeance. The German lines have not taken it kindly ever since the Cunard Steamship Co. went into the Mediterranean business and there has been more or less rate cutting ever since spring. The Cunard Line has now reduced prices with a suddenness that has jarred the entire shipping community. First cabin rates on the *Campania* and *Lucania* are reduced from \$100 to \$60 and on the *Umbria* and *Etruria* from \$65 to \$50. The second cabin rates have been reduced from \$47.50 to \$40 on the *Campania* and *Lucania* and on all other steamers from \$42.50 to \$30. The International Mercantile Marine Co. has reduced the first cabin rates on the *Oceanic* from \$100 to \$65 and has made a common first class rate of \$50 on its giant liners the *Baltic*, *Cedric* and *Celtic*. How long these schedules will last remains to be seen.

#### TRADE NOTES.

The Victor Metals Co., East Braintree, Mass., (and with offices at 29 Broadway, New York), are now erecting a rolling mill for the manufacture of their Victor non-corrosive silver metal into sheets and rods, and wish to have sent them catalogues of rolling mill machinery, including furnaces. The company finds a rolling mill of their own necessary, as the demand for their metal is so large that other mills now manufacturing alloys cannot handle this metal to advantage.

The Knowles Steam Works, 114 Liberty street, New York city, are distributing Bulletin K-73 describing their recently designed "Express" pump. This pump is of the reciprocating type and is directly connected to an electric motor without gears or belts, and a 250-gallon pump runs at a speed of 300 revolutions per minute. In a test, the details of which are given, this pump showed an efficiency of 93 per cent. Pumps of this type are built in capacities of from 200 to 4,000 gallons per minute and for heads from 100 to 2,000 ft.

Meyer-gear pumping engines for small water-works and elevator service are described in Bulletin L-601, published by the Laidlaw-Dunn-Gordon Co., 114 Liberty street, New York city. These engines are built in the cross-compound and three-cylinder compound types, and with fork frames of rolling-mill frames, and their cost is said to be moderate, compared with Corliss engines, while their steam consumption is hardly more than half of that of the best types of direct-acting compound pumps. When running condensing with ordinary steam pressure they show an average steam consumption of less than 20 lbs. per horse-power per hour, which would effect a saving, compared with direct-acting compound pumps, of about 130 tons of coal per year for every million

gallons daily capacity. These pumping engines are said to have found a wide application in small water-works plants and for circulating brine and hot water, feeding large boiler plants, etc.

Jenkins Bros., 71 John street, New York, have just issued a little catalogue entitled, "Valve Troubles and How to Avoid Them." The first part of the booklet is devoted to a summary of the difficulties commonly encountered in the installation and use of valves, together with some suggestions for remedying them. The balance of the book is devoted to the illustration and description of the principal type of valves manufactured by Jenkins Bros. The first valve illustrated is the regular Jenkins Bros. brass globe valve which is claimed to be the type of valve most used today, there being comparatively few steel plants in the United States where those valves are not in use. The extra heavy brass valve is next shown, designed for a working pressure of from 150 to 300 lbs. or for hydraulic working for pressures up to 1,000 lbs. The booklet is illustrated with half tones throughout and special attention is called to the cut of the Excelsior straightway back-pressure valve, showing at a glance the simplicity and advantages of the valve. The booklet will be sent to anyone upon request.

The Wellman-Seaver-Morgan Co. have just put out a very neat booklet entitled "What We Do." The purpose of the pamphlet is to briefly set forth in a general way the scope of their work. While the bulletin is quite an extended thing in itself, it is really no more than a general index of their various classified catalogues which will be furnished to parties interested upon request. During its brief existence this company has grown to great proportions and has important contract work under way in all parts of the world. Its engineering department embodies the associated skill of a large and efficient technical staff; its manufacturing facilities are modern and extensive. It will design and build equipment for every operation, from taking the ore out of the ground to turning it into the completed product. There is nothing in an engineering way which this company will not undertake, but it is chiefly noted for its designs for iron and steel plants and for its construction of hoisting and conveying machinery. The booklet is beautifully illustrated with half-tone pictures from photographs and drawings of work actually done by the company.

The Westinghouse company has issued a beautiful catalogue descriptive of the company's exhibition at the World's Fair at St. Louis. Since this company was formed, less than forty years ago, there has been added to it from year to year magnificent enterprises which now constitute a vast chain. Almost everyone who travels is familiar with the great advancements in speed, safety and comfort attributable to the Westinghouse brake and switching and signalling devices. These various appliances have practically revolutionized railway traffic all over the world. The Westinghouse company's product embraces apparatus of almost every known application. The Westinghouse steam turbines, gas engines and steam engines are in successful operation in most of the large power plants in the country. A typical example of the combined product of the electric and machine interests may be seen in the large service plant of the World's Fair located at the west end of the machinery building. In and about St. Louis and the exhibition grounds are to be found many typical Westinghouse installations. The catalogue is in itself a brief history of the Westinghouse and subsidiary companies and is novel in style, treatment and make-up. It is very beautifully illustrated throughout and those who have it will doubtless be glad to keep it.

While being towed into Lorain during the squall Aug. 25, the big propeller A. B. Wolvin broke away from tugs Steadman and Guilder. She was carried out into the lake and just missed striking a rock foundation for the new breakwater.



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VOL. XXX.

CLEVELAND, O., SEPT. 1, 1904.

No. 9



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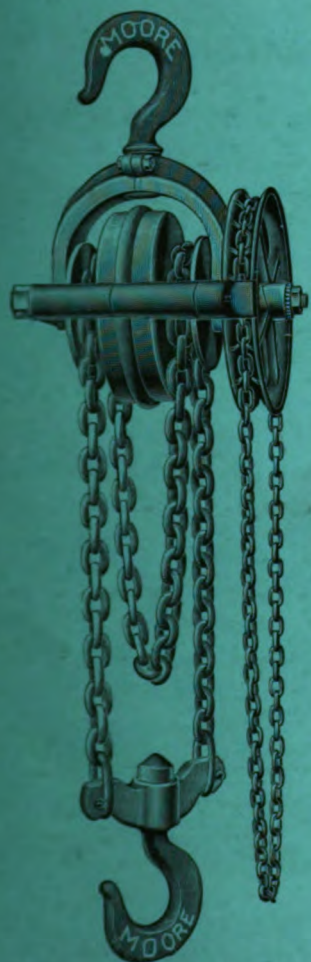


Fig. 100.  
"Moore" Anti-Friction  
Chain Hoist.



Fig. 111.

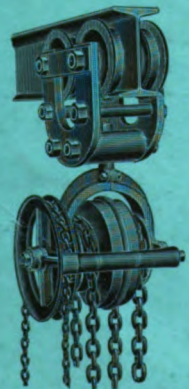


Fig. 114.



Fig. 200.  
"Standard" Screw  
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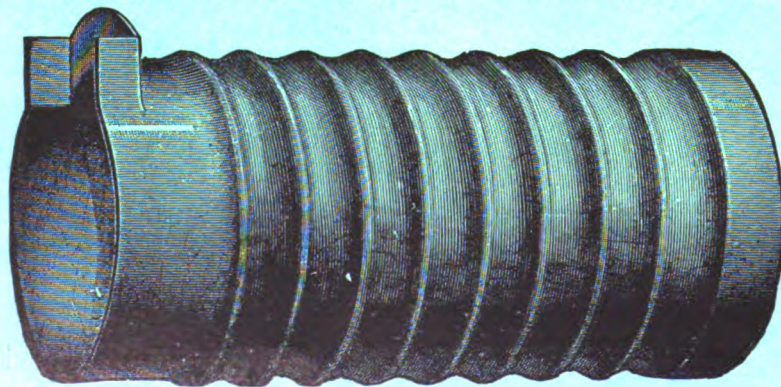
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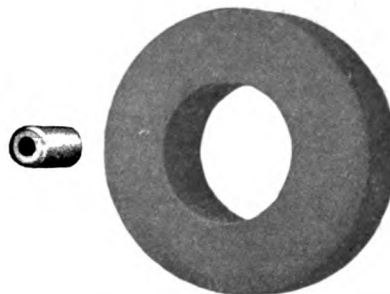
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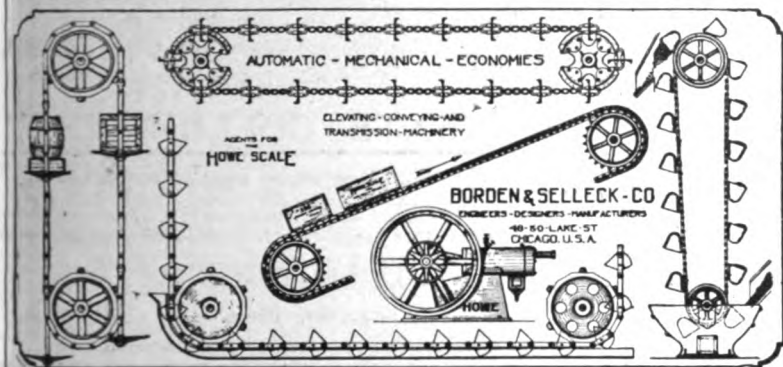
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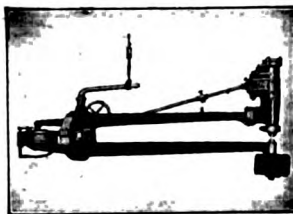
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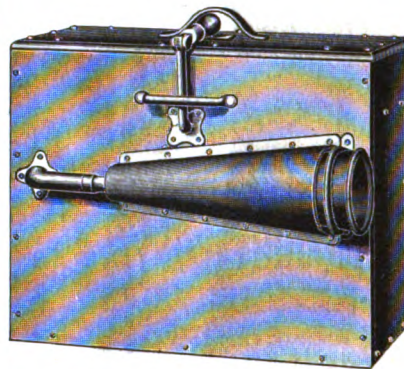
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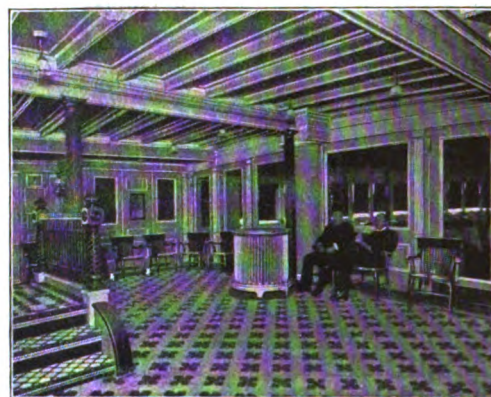
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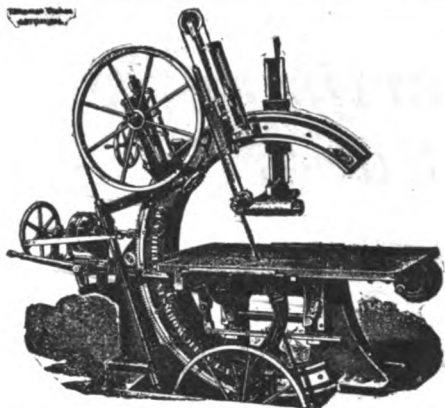
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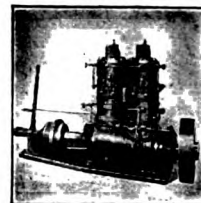
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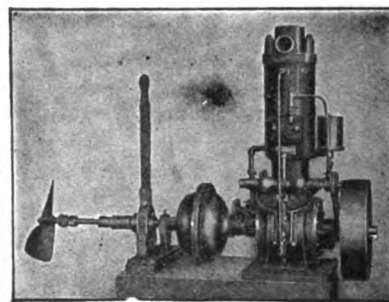
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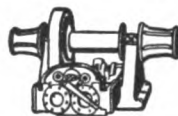
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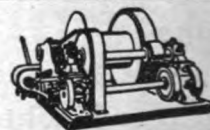
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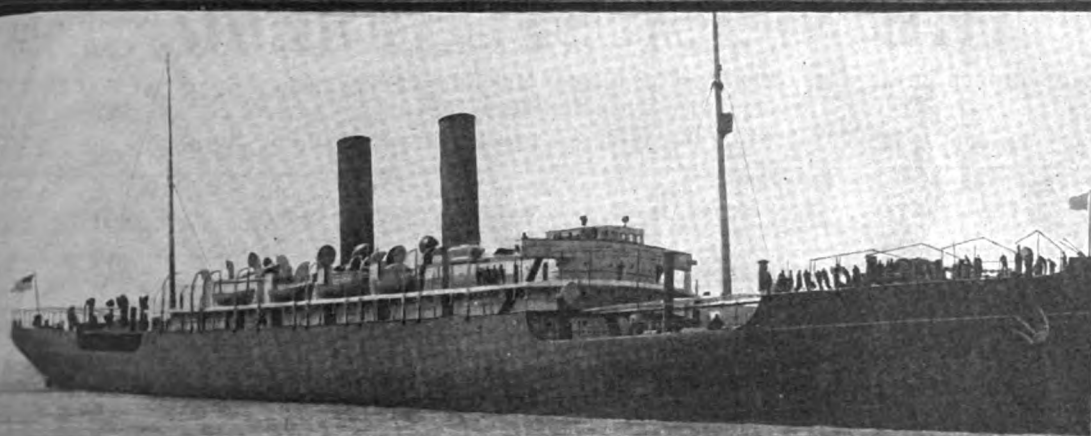
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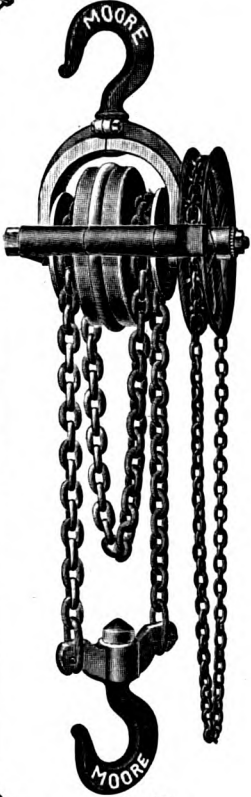
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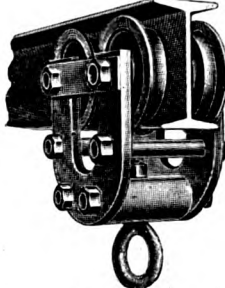



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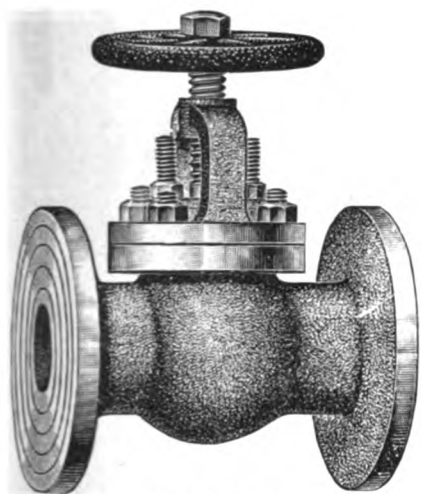
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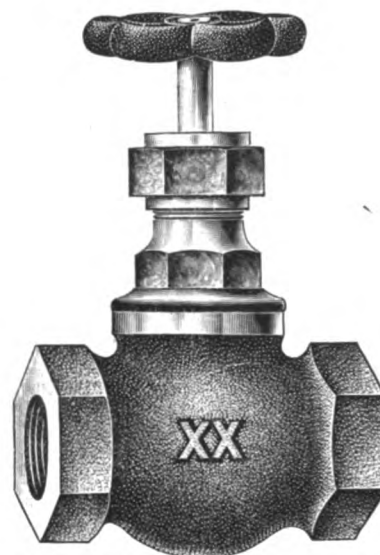
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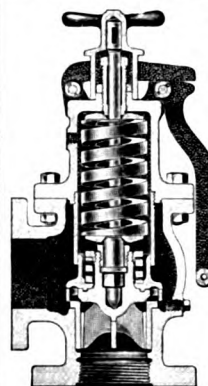
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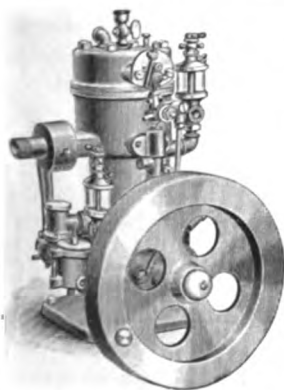
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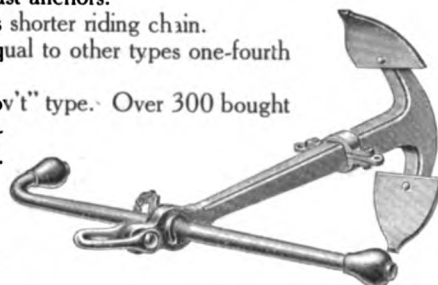
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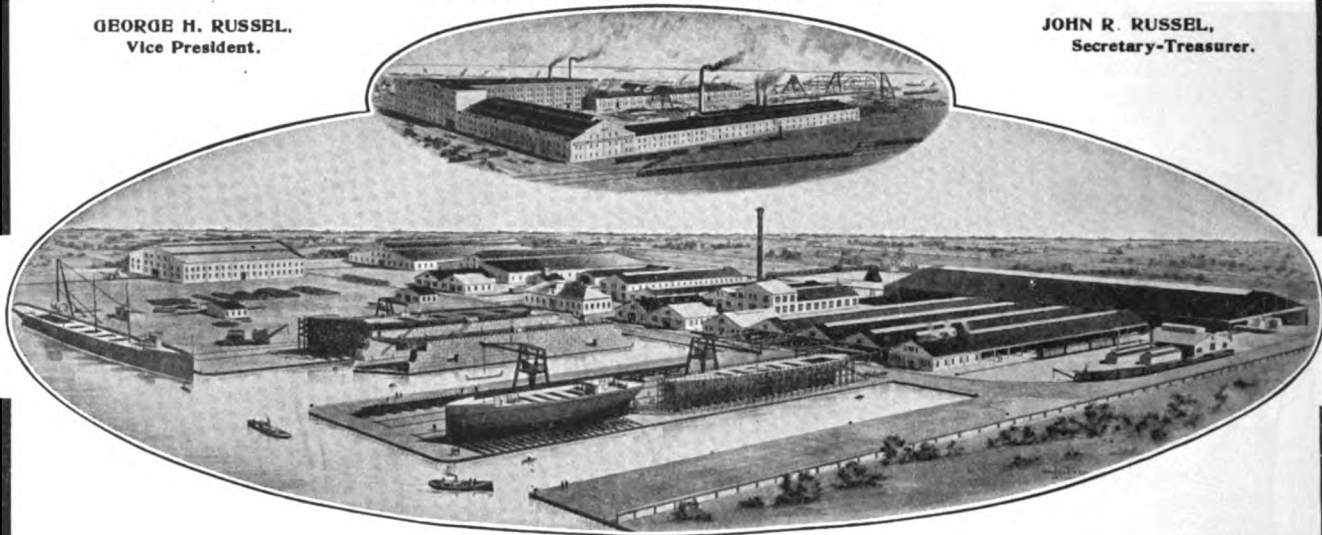
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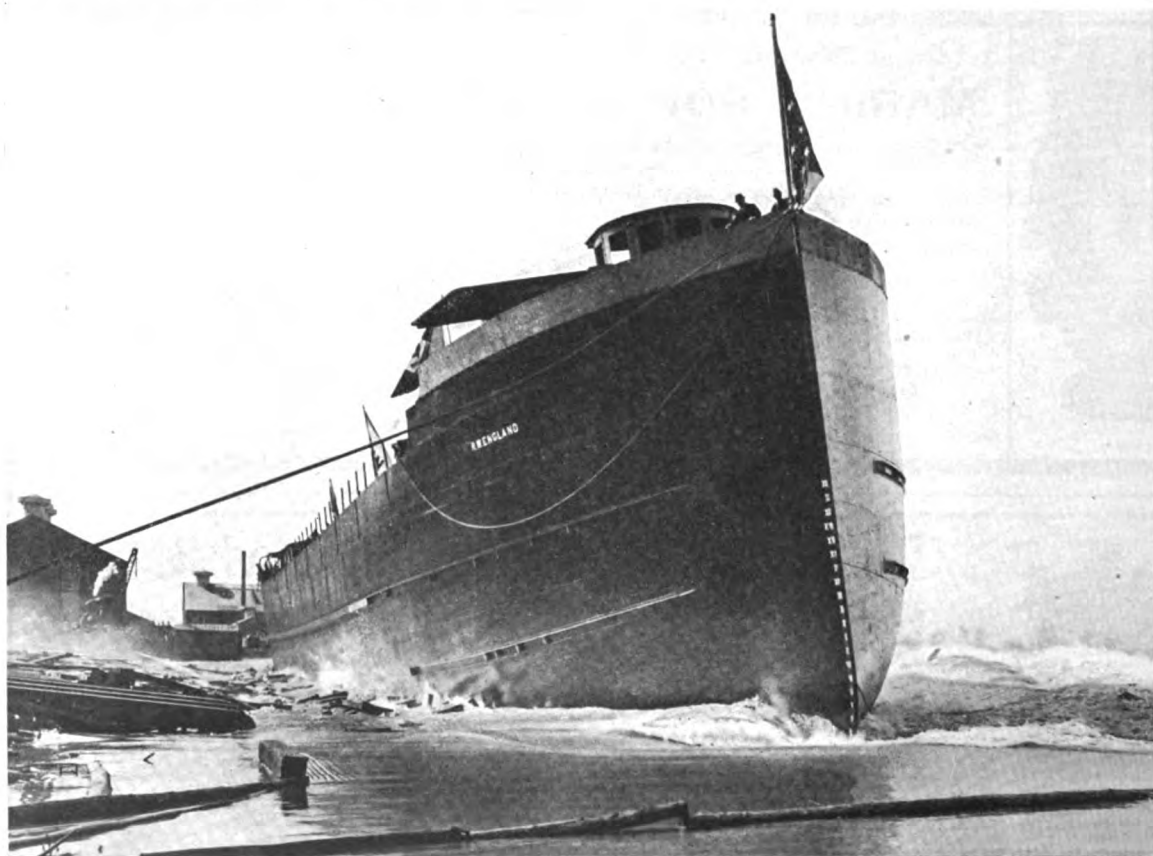
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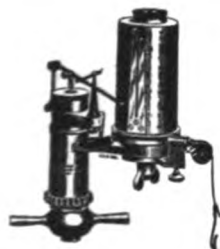
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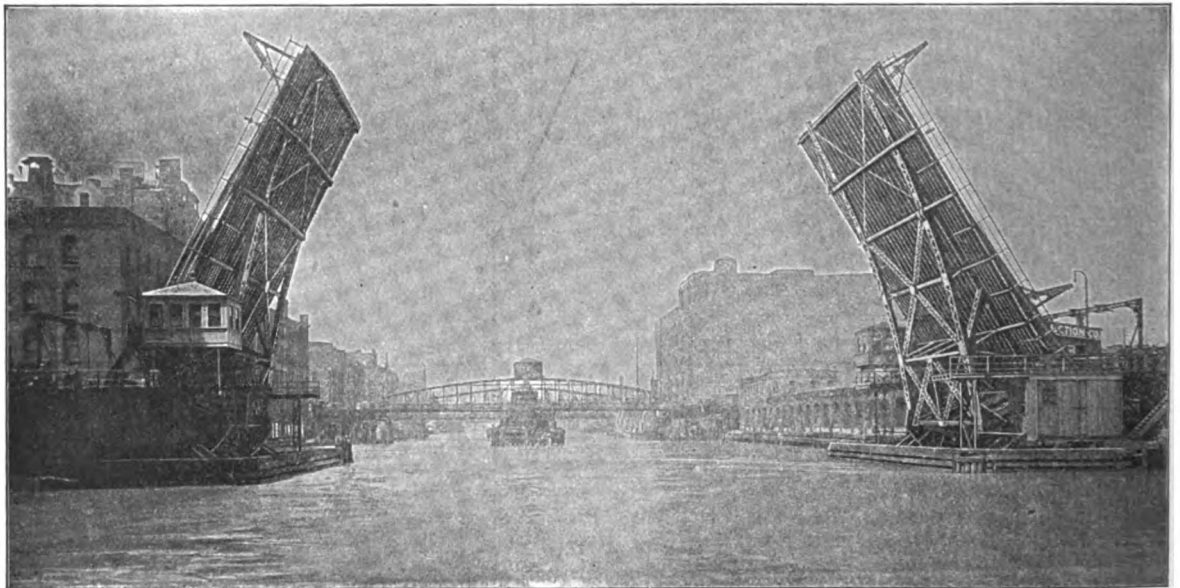
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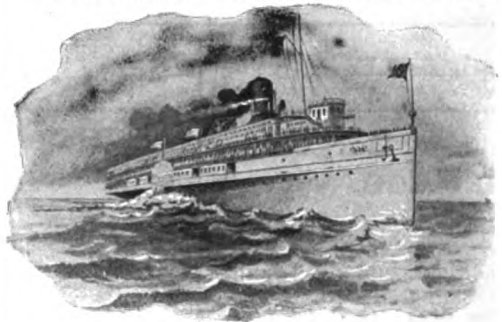
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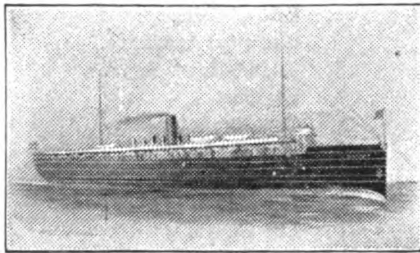
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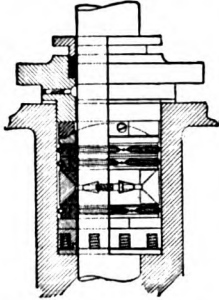
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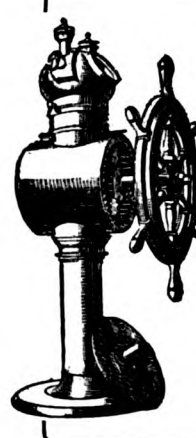
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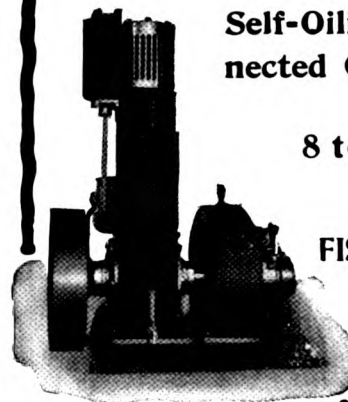
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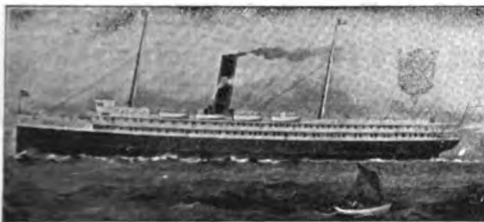
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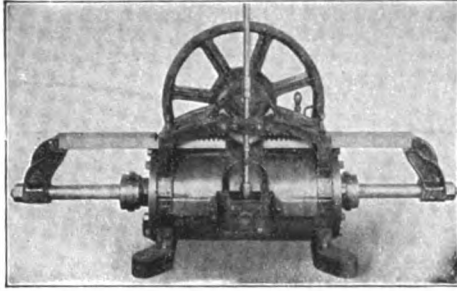
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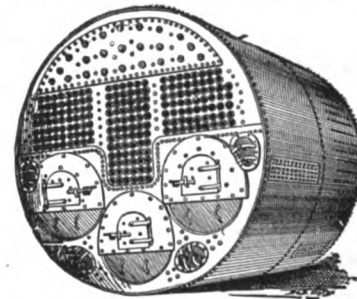
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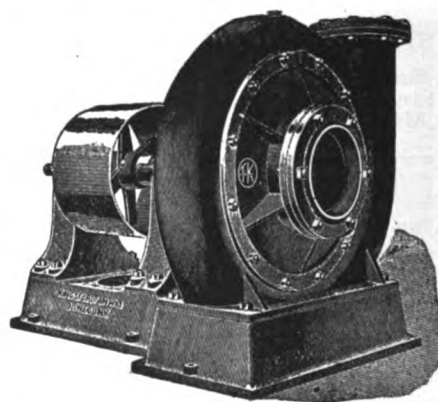


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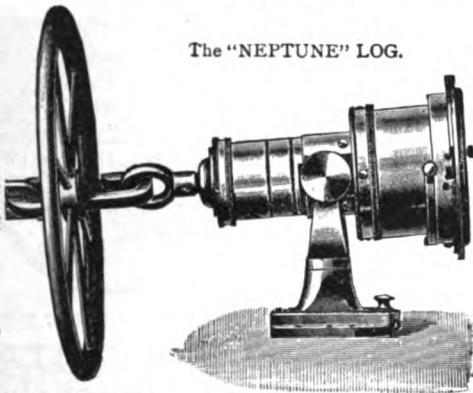
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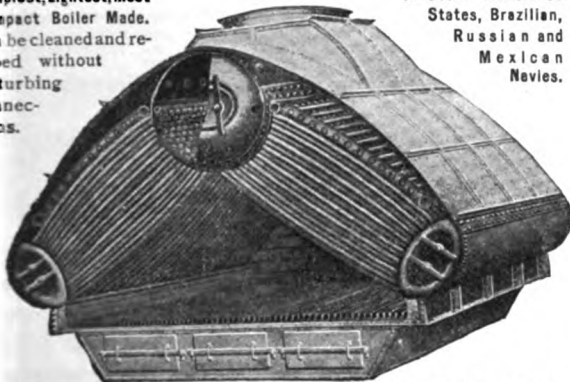
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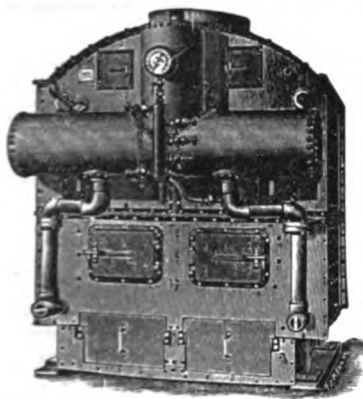
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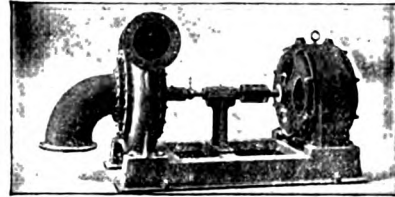
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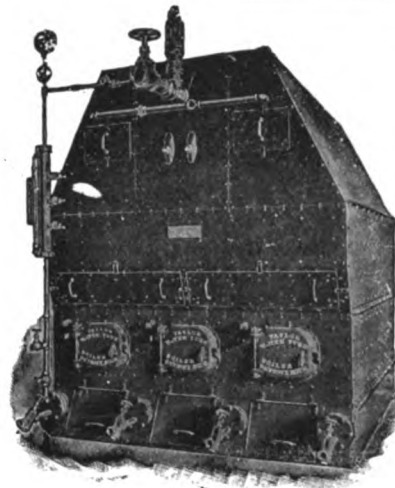
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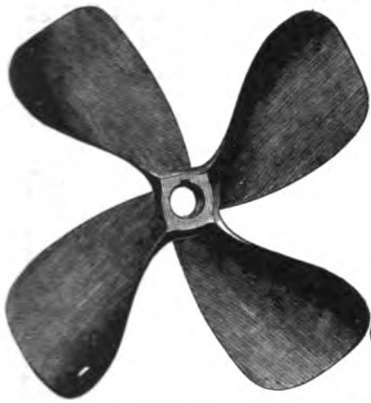
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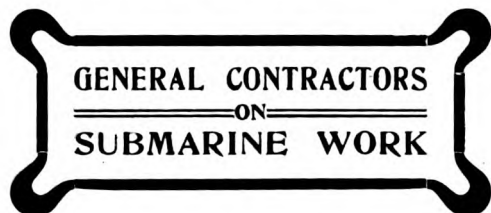
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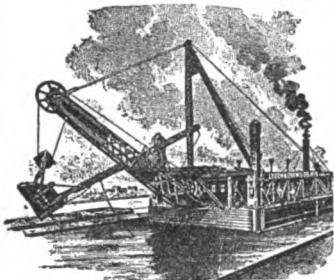
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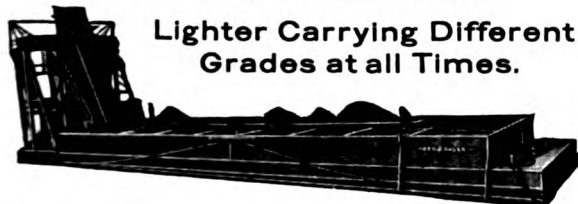
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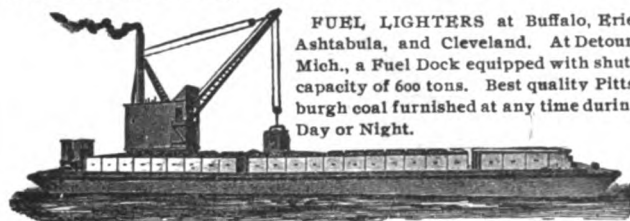
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## DREDGING CONTRACTORS.

Buffalo Dredging Co.....Buffalo.  
Chicago & Gt. Lakes Dredge & Dock Co.....Chicago.  
Dunbar & Sullivan Dredging Co.....Buffalo.  
Fitz-Simons & Connell Co.....Chicago.  
Hickler Bros. ....Sault Ste. Marie, Mich.  
Lake Superior Contracting & Dredging Co.....Duluth, Minn.  
Smith Co., L. P. & J. A.....Cleveland.  
Starke Dredge & Dock Co., C. H.....Milwaukee.  
Sullivan, M. ....Detroit.

## DRYING APPARATUS.

Bayley & Sons Co., Wm.....Milwaukee, Wis.  
Sturtevant, B. F., Co.....Hyde Park, Mass.

## DRY DOCKS.

American Ship Building Co.....Cleveland.  
Atlantic Works.....East Boston, Mass.  
Buffalo Dry Dock Co.....Buffalo.  
Chicago Ship Building Co.....Chicago.  
Craig Ship Building Co.....Toledo, O.  
Cramp, Wm. & Sons.....Philadelphia.  
Detroit Ship Building Co.....Detroit.  
Great Lakes Engineering Works.....Detroit.  
Lockwood Mfg. Co.....East Boston, Mass.  
Manitowoc Dry Dock Co.....Manitowoc, Wis.  
Milwaukee Dry Dock Co.....Milwaukee.  
Newport News Ship Building Co.....Newport News, Va.  
Shipowners Dry Dock Co.....Chicago.  
Superior Ship Building Co.....Superior, Wis.  
United States Ship Building Co.....New York.



## Buyers' Directory of the Marine Trade.—Continued.

**ELECTRIC HOISTS AND CRANES.**

Fisher Electrical Works.....Detroit.  
General Electric Co.....Schenectady, N. Y.  
Pawling & Harnischfeger.....Milwaukee.  
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

**ELECTRIC LIGHT AND POWER PLANTS.**

Fisher Electrical Works.....Detroit.  
General Electric Co.....Schenectady, N. Y.  
Mietz, Aug.....Hyde Park, Mass.  
Sturtevant, B. F. Co.....Trenton, N. J.  
Thropp & Sons, John E.....Trenton, N. J.  
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

**ENGINE BUILDERS, MARINE.**

American Ship Building Co.....Cleveland.  
Atlantic Works.....East Boston, Mass.  
Bertram Engine Works Co., Ltd.....Toronto, Can.  
Chicago Ship Building Co.....Chicago.  
Chase Machine Co.....Cleveland.  
Cramp, Wm. & Sons.....Philadelphia.  
Crug Ship Building Co.....Toledo, O.  
Dake Engine Co.....Grand Haven, Mich.  
Detroit Ship Building Co.....Detroit.  
Fletcher, W. & A. Co.....Hoboken, N. J.  
Fore River Ship & Engine Co.....Quincy, Mass.  
Great Lakes Engineering Works.....Detroit, Mich.  
Hall Bros.....Philadelphia.  
Jenks Ship Building Co.....Port Huron, Mich.  
Lockwood Mfg. Co.....East Boston, Mass.  
Macbeth Iron Co.....Cleveland.  
Mietz, Aug.....New York.  
Milwaukee Dry Dock Co.....Milwaukee.  
Mosher, Chas. D.....New York.  
Moulton Steering Engine Co.....New York.  
Newport News Ship Building Co.....Newport News, Va.  
Northwestern Steam Boiler & Mfg. Co.....Duluth, Minn.  
Roach's Ship Yard.....Chester, Pa.  
Scheriffs Mfg. Co.....Milwaukee.  
Superior Ship Building Co.....Superior, Wis.  
Thropp, J. E. & Sons Co.....Trenton, N. J.  
Trout, H. G.....Buffalo.  
United States Ship Building Co.....New York.  
Willard, Chas. P. & Co.....Chicago.

**ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.**

Cory, Chas. & Son.....New York.  
Marine Mfg. Supply Co.....New York.

**ENGINEERING SPECIALTIES AND SUPPLIES.**

Crane Co.....Chicago.  
Kelley & Mueller.....New York.  
Lunkenheimer Co.....Cincinnati.  
New York Belting & Packing Co.....New York.  
Northwestern Steam Boiler & Mfg. Co.....Duluth, Minn.

**ENGINEERS, MARINE, MECHANICAL, CONSULTING.**

Hynd, Alexander.....Cleveland.  
Hunt, Robt. W. & Co.....Chicago.  
Kidd, Joseph.....Duluth, Minn.  
Loveloy, H. O.....Buffalo.  
Matteson & Drake.....Philadelphia.  
Mosher, Chas. D.....New York.  
Nace, James.....Cleveland.  
Pittsburg Testing Laboratory, Ltd.....Pittsburg.  
Rice, Henry.....Buffalo.  
Roelker, H. B.....New York.  
Sutler, Perkins & Field.....New York.  
Steel, Adam.....Cleveland.  
Wood, W. J.....Chicago.

**FANS FOR VENTILATION, EXHAUST, ETC.**

Sturtevant, B. F. Co.....Hyde Park, Mass.

**FEED WATER PURIFIERS AND HEATERS.**

Ross Valve Co.....Troy, N. Y.

**FIXTURES FOR LAMPS, OIL OR ELECTRIC.**

General Electric Co.....Schenectady, N. Y.  
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

**FORGES.**

Sturtevant, B. F. Co.....Boston.

**FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.**

Cleveland City Forge & Iron Co.....Cleveland.  
Fore River Ship & Engine Co.....Quincy, Mass.  
Macbeth Iron Co.....Cleveland.

**FLUE WELDING.**

Fix's, S. Sons.....Cleveland.

**FUEL ECONOMIZERS.**

Sturtevant Co., B. F.....Hyde Park, Mass.

**FUELING COMPANIES AND COAL DEALERS.**

Hanna, M. A. & Co.....Cleveland.  
Ironville, Dock & Coal Co.....Toledo, O.  
Parker Bros. Co., Ltd.....Detroit.  
Picklands, Mather & Co.....Cleveland.  
Pittsburg Coal Co.....Cleveland.  
Smith, Stanley B., & Co.....Detroit.  
Smith Coal & Dock Co., Stanley B.....Toledo, O.

**FURNACES FOR BOILERS.**

Continental Iron Works.....New York.

**GASKETS, RUBBER.**

New York Belting & Packing Co.....New York.

**GAS BUOYS.**

Safety Car Heating & Lighting Co.....New York.

**GAS AND GASOLINE ENGINES.**

Chase Machine Co.....Cleveland.  
Georgian Bay Engineering Works.....Midland, Ont.  
Reliance Mfg. Co.....City Island, New York.  
Temple Pump Co.....Chicago.

**GAUGES, STEAM AND VACUUM.**

American Steam Gauge & Valve Mfg. Co.....Boston.  
Ashton Valve Co.....Boston.  
Lunkenheimer Co.....Cincinnati.  
Standard Gauge Mfg. Co.....Syracuse, N. Y.

**GAUGES, WATER.**

Bonner & Co., Wm. T.....Boston.  
Lunkenheimer Co.....Cincinnati, O.  
Standard Gauge Mfg. Co.....Syracuse, N. Y.

**GRAPHITE.**

Dixon Crucible Co., Joseph.....Jersey City, N. J.

**HAMMERS, STEAM.**

Chase Machine Co.....Cleveland.

**HEATING APPARATUS.**

Sturtevant, B. F. Co.....Hyde Park, Mass.

**HOISTS FOR CARGO, ETC.**

American Ship Building Co.....Cleveland.  
Brown Hoisting Machinery Co. (Inc.).....Cleveland.  
Chase Machine Co.....Cleveland.  
General Electric Co.....New York.  
Georgian Bay Engineering Works.....Midland, Ont.  
Hyde Windlass Co.....Bath, Me.  
Marine Iron Co.....Bay City, Mich.  
Mietz, Aug.....New York.  
Pawling & Harnischfeger.....Milwaukee.  
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

**HOLLOW STAYBOLT IRON.**

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

**HOSE, RUBBER.**

New York Belting & Packing Co.....New York.

**HYDRAULIC DREDGES.**

Great Lakes Engineering Works.....Detroit.

**HYDRAULIC TOOLS.**

Watson-Stillman Co., The.....New York.

**ICE MACHINERY.**

Great Lakes Engineering Works.....Detroit.  
Roelker, H. B.....New York.

**INDICATORS FOR STEAM ENGINES.**

American Steam Gauge Co.....Boston.  
Ashton Valve Co.....Boston.

**INJECTORS.**

American Injector Co.....Detroit.  
Crane Co.....Chicago.  
Jenkins Bros.....New York.  
Lunkenheimer Co.....Cincinnati.  
Penberthy Injector Co.....Detroit, Mich.

**INSURANCE, MARINE.**

Elphicke, C. W. & Co.....Chicago.  
Fleming & Co., P. H.....Chicago.  
Frankfort Marine, A. & P. G. Ins. Co.....New York.

**INSURANCE, MARINE—Continued.**

Gilchrist & Co., C. P.....Cleveland.  
Hawgood & Co., W. A.....Cleveland.  
Helm & Co., D. T.....Duluth.  
Hutchinson & Co.....Cleveland.  
McCarthy, T. R.....Montreal.  
McCurdy, Geo. L.....Chicago.  
Mitchell & Co.....Cleveland.  
Parker Bros. Co., Ltd.....Detroit.  
Peck, Chas. E. & W. F.....New York & Chicago.  
Prindiville & Co.....Chicago.  
Richardson, W. C.....Cleveland.  
Sullivan, D. & Co.....Chicago.  
Voss, F. D.....New York.

**IRON ORE AND PIG IRON.**

Hanna, M. A. & Co.....Cleveland.  
Pickands, Mather & Co.....Cleveland.

**LAUNCHES—STEAM, NAPHTHA, ELECTRIC.**

Georgian Bay Engineering Works.....Midland, Ont.  
Marine Construction & D. D. Co.....Mariner's Harbor, S. I., N. Y.  
Truscott Boat Mfg. Co.....St. Joseph, Mich.  
Willard, Chas. P.....Chicago.

**LIFE PRESERVERS, LIFE BOATS, BUOYS.**

Armstrong, Cork Co.....Pittsburg.  
Dreim, Thos. & Son.....Wilmington, Del.  
Kahnweiler's Sons, D.....New York.

**LIGHTS, SIDE AND SIGNAL.**

Russell & Watson.....Buffalo.

**LOGS.**

Walker & Sons, Thomas.....Birmingham, Eng.  
Also Ship Chandlers.

**LUBRICATING GRAPHITE.**

Dixon Crucible Co., Joseph.....Jersey City, N. J.

**LUBRICATORS.**

Crane Co.....Chicago.  
Lunkenheimer Co.....Cincinnati.

**LUMBER.**

Martin-Barriss Co.....Cleveland.

**MACHINISTS.**

Chase Machine Co.....Cleveland.  
Gogebic Steam Boiler Works.....Duluth, Minn.  
Hickler Bros.....Sault Ste. Marie, Mich.  
Lockwood Mfg. Co.....East Boston, Mass.  
Macbeth Iron Co.....Cleveland.  
Union Machine & Boiler Co.....Cleveland.

**MACHINE TOOLS (WOOD WORKING).**

Atlantic Works, Inc.....Philadelphia.

**MARINE RAILWAYS.**

Hickler Bros.....Sault Ste. Marie, Mich.

**MARINE GLUE.**

Ferdinand & Co., L. W.....Boston, Mass.

**MARINE RAILWAYS, BUILDERS OF.**

Crandall & Son, H. I.....East Boston, Mass.

**MATTRESSES, CUSHIONS, BEDDING.**

Fogg, M. W.....New York.

**MECHANICAL DRAFT FOR BOILERS.**

American Ship Building Co.....Cleveland.  
Detroit Ship Building Co.....Detroit.  
Great Lakes Engineering Works.....Detroit.  
Sturtevant, B. F. Co.....Hyde Park, Mass.

**MELTING POT AND PAYING LADLE.**

(For Paying Seams of Decks with Marine Glue.)  
Ferdinand & Co., L. W.....Boston.

**METALLIC PACKING.**

Katzenstein, L. & Co.....New York.

**METAL POLISH.**

Bertram's Oil Polish Co.....Boston.

**MOTORS, GENERATORS—ELECTRIC.**

Fisher Electrical Works.....Detroit.  
General Electric Co.....Schenectady, N. Y.  
Sturtevant, B. F. Co.....Hyde Park, Mass.  
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

## Buyers' Directory of the Marine Trade.—Continued.

**NAUTICAL INSTRUMENTS.**

Ritchie, E. S., &amp; Sons.....Brookline, Mass.

**NAVAL ARCHITECTS.**

Hynd, Alexander .....Cleveland.  
 Kidd, Joseph.....Duluth, Minn.  
 Lovejoy, H. O.....Buffalo.  
 Matteson & Drake.....Philadelphia.  
 Mosher, Chas. D.....New York.  
 Nacey, James .....Cleveland.  
 Rice, Henry .....Buffalo.  
 Sadler, Perkins & Field.....New York.  
 Steel, Adam .....Cleveland.  
 Wood, W. J.....Chicago.

**OAKUM.**

DeGrauw, Aymar & Co.....New York.  
 Stratford, Oakum Co.....Jersey City, N. J.

**OIL ENGINES.**

Mietz, Aug. ....New York.

**OILS AND LUBRICANTS.**

Dixon Crucible Co., Joseph.....Jersey City, N. J.  
 Standard Oil Co.....Cleveland.

**PACKING.**

Crane Co. ....Chicago.  
 Jenkins Bros. ....New York.  
 Katzenstein, L. & Co.....New York.  
 New York Belting & Packing Co.....New York.

**PACKING TOOL.**

Matteson &amp; Drake .....Philadelphia.

**PAINTS.**

Baker, Howard H. & Co.....Buffalo.  
 Detroit Varnish Co.....Detroit.  
 Detroit White Lead Works.....Detroit.  
 Forest City Paint and Varnish Co.....Cleveland.  
 New Jersey Zinc Co.....New York.  
 Upson-Walton Co. ....Duluth, Minn.

**PATTERN SHOP MACHINERY.**

Atlantic Works, Inc.....Philadelphia.

**PILE DRIVING AND SUBMARINE WORK.**

Buffalo Dredging Co.....Buffalo.  
 Chicago & Gt. Lakes Dredge & Dock Co.....Chicago.  
 Dunbar & Sullivan Dredging Co.....Buffalo.  
 Fitz-Simons & Connell Co.....Chicago.  
 Hickler Bros. ....Sault Ste. Marie, Mich.  
 Lake Superior Contracting & Dredging Co.....Duluth, Minn.  
 Parker Bros. Co., Ltd.....Detroit.  
 Smith Co., L. P. & J. A.....Cleveland.  
 Starke Dredge & Dock Co., C. H.....Milwaukee.  
 Sullivan, M. ....Detroit.

**PIPE, WROUGHT IRON.**

Crane Co. ....Chicago.  
 Macbeth Iron Co.....Cleveland.

**PLANING MILL MACHINERY.**

Atlantic Works, Inc.....Philadelphia.

**PLATES—SHIP, STRUCTURAL, ETC.**

Otis Steel Co.....Cleveland.

**PNEUMATIC TOOLS.**

Allen, John F.....New York.

**POLISH FOR METALS.**

Bertram's Oil Polish Co.....Boston.

**PRESSURE REGULATORS.**

Kieley & Mueller .....New York.  
 Ross Valve Co.....Troy, N. Y.

**PROPELLER WHEELS.**

American Ship Building Co.....Cleveland.  
 Atlantic Works .....East Boston, Mass.  
 Cramp, Wm. & Sons.....Philadelphia.  
 Detroit Ship Building Co.....Detroit.  
 Fore River Ship & Engine Co., Quincy, Mass.  
 Great Lakes Engineering Works.....Detroit.  
 Hyde Windlass Co.....Bath, Me.  
 Jenks Ship Building Co.....Port Huron, Mich.  
 Lockwood Mfg. Co.....East Boston, Mass.  
 Macbeth Iron Co.....Cleveland.  
 Milwaukee Dry Dock Co.....Milwaukee.  
 Newport News Ship Building Co.....Newport News, Va.  
 Phosphor Bronze Smelting Co., Ltd.....Philadelphia.  
 Roelker, H. B.....New York.  
 Sheriffs Mfg. Co.....Milwaukee.  
 Superior Ship Building Co.....Superior, Wis.  
 Thropp & Sons Co., J. E.....Trenton, N. J.  
 Trout, H. G.....Buffalo.  
 United States Ship Building Co.....New York.

**PROJECTORS, ELECTRIC.**

General Electric Co.....Schenectady, N. Y.  
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

**PUMPS FOR VARIOUS PURPOSES.**

Blake, Geo. F., Mfg. Co.....New York.  
 Great Lakes Engineering Works.....Detroit.  
 Kingsford Foundry & Machine Works.....Oswego, N. Y.

**PUNCHES, RIVETERS, SHEARS.**

Allen, John F.....New York.

**RANGES.**

Russell &amp; Watson .....Buffalo.

**REFRIGERATING APPARATUS.**

Great Lakes Engineering Works.....Detroit.  
 Roelker, H. B.....New York.

**REGISTER FOR CLASSIFICATION OF VESSELS.**

Great Lakes Register .....Cleveland.  
 Record of American & Foreign Shipping.....New York.

**REPAIRS—ENGINE AND BOILER.**

(See also Boiler Manufacturers and Engine Builders.)

Georgian Bay Engineering Works.....Midland, Ont.  
 Gogebic Steam Boiler Works.....Duluth, Minn.  
 Forest City Boiler Co.....Cleveland.  
 Marine Iron Co.....Duluth, Minn.

**RIVETING MACHINES.**

Allen, John F.....New York.

**ROWBOATS.**

Mullins, W. H.....Salem, O.

**SAFETY VALVES.**

American Steam Gauge & Valve Mfg. Co.....Boston.  
 Ashton Valve Co.....Boston.  
 Crane Co. ....Chicago.  
 Lunkenheimer Co. ....Cincinnati.

**SAIL MAKERS.**

Baker, Howard H. & Co.....Buffalo.  
 Upson-Walton Co.....Cleveland.  
 Wilson & Silsby .....Boston.

**SALVAGE COMPANIES.**

See Wrecking Companies.

**SEARCH LIGHTS.**

General Electric Co.....Schenectady, N. Y.  
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

**SHEARS.**

See Punches, Rivets, and Shears.

**SHIP AND BOILER PLATES AND SHAPES.**

Otis Steel Co.....Cleveland.

**SHIP BUILDERS.**

American Ship Building Co.....Cleveland.  
 Atlantic Works .....East Boston, Mass.  
 Bertram Engine Works Co., Ltd.....Toronto, Can.  
 Buffalo Dry Dock Co.....Buffalo.  
 Cramp, Wm. & Sons.....Philadelphia.  
 Craig Ship Building Co.....Toledo, O.  
 Chicago Ship Building Co.....Chicago.  
 Detroit Ship Building Co.....Detroit.  
 Fore River Ship & Engine Co., Quincy, Mass.  
 Great Lakes Engineering Works.....Detroit.  
 Jenks Ship Building Co.....Port Huron, Mich.  
 Lockwood Mfg. Co.....East Boston, Mass.  
 Manitowoc Dry Dock Co.....Manitowoc, Wis.  
 Milwaukee Dry Dock Co.....Milwaukee.  
 Newport News Ship Building Co.....Newport News, Va.  
 Roach's Ship Yard .....Chester, Pa.  
 Shipowner's Dry Dock Co.....Chicago.  
 Smith & Son, Abram.....Algonac, Mich.  
 United States Ship Building Co.....New York.  
 Willard, Chas. P. & Co.....Chicago.

**SHIP CHANDLERS.**

Baker, Howard H. & Co.....Buffalo.  
 Marine Mfg. & Supply Co.....New York.  
 Upson-Walton Co.....Cleveland.

**SHIP LANTERNS AND LAMPS.**

Russell &amp; Watson .....Buffalo.

**SHIP TIMBER.**

Martin-Barriss Co.....Cleveland.

**SMOOTH-ON COMPOUND, FOR REPAIRS.**

Smooth-On Mfg. Co.....Jersey City, N. J.

**STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.**

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

**STEAM VESSELS FOR SALE.**

Gilchrist & Co., C. P. ....Cleveland.  
 Holmes, Samuel .....New York.  
 Lester, S. S.....Quebec, Can.  
 McCarthy, T. R.....Montreal, Can.

**STEAMSHIP LINES, PASS. AND FREIGHT.**

American Line .....New York.  
 Anchor Line .....Buffalo.  
 Boston Steamship Co.....Boston.  
 Cleveland & Buffalo Transit Co.....Cleveland.  
 Detroit & Cleveland Line.....Cleveland.  
 Erie & Western Trans. Co.....Buffalo.  
 Goodrich Trans. Co.....Chicago.  
 International Mercantile Marine Co.....Philadelphia.  
 Manitou Steamship Co.....Chicago.  
 Mexican-American S. S. Co.....New Orleans, La.  
 New York & Cuba Mail S. S. Co.....New York.  
 Niagara, St. Catharines & Toronto Ry. & Nav. Co.....St. Catharines, Ont.  
 Northern Michigan Trans. Co.....Chicago.  
 Red Star Line .....New York.  
 Richelieu & Ontario Nav. Co.....Montreal, Can.  
 United Fruit Co .....Boston.

**STEEL CASTINGS.**

Macbeth Iron Co.....Cleveland.  
 Otis Steel Co.....Cleveland.

**STEERING APPARATUS.**

American Ship Building Co.....Cleveland.  
 Chase Machine Co.....Cleveland.  
 Dake Engine Co.....Grand Haven, Mich.  
 Detroit Ship Building Co.....Detroit.  
 Hyde Windlass Co.....Bath, Me.  
 Jenks Ship Building Co.....Port Huron, Mich.  
 Marine Mfg. & Supply Co.....Cleveland.  
 Moulton Steering Engine Co.....New York.  
 Pawling & Harnischfeger .....Milwaukee.  
 Sheriffs Mfg. Co.....Milwaukee.

**SUBMARINE DIVING APPARATUS.**

Morse & Son, A. J.....Boston.  
 Schrader's Son, A.....New York.

**SURVEYORS, MARINE.**

Gaskin, Edward .....Buffalo.  
 Hynd, Alexander .....Cleveland.  
 Lovejoy, H. O.....Buffalo.  
 Matteson & Drake .....Philadelphia.  
 Parker Bros. Co., Ltd.....Detroit.  
 Nacey, James .....Cleveland.  
 Rice, Henry .....Buffalo.  
 Steel, Adam .....Cleveland.  
 Wood, W. J.....Chicago.

**TESTS OF MATERIALS.**

Hunt, Robert W. & Co.....Chicago.  
 Pittsburg Testing Laboratory, Ltd.....Pittsburg.

**TILING, INTERLOCKING RUBBER.**

New York Belting &amp; Packing Co.....New York.

**TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.**

Allen, John F.....New York.  
 Watson-Stillman Co.....New York.

**TOOLS, WOOD WORKING.**

Atlantic Works, Inc.....Philadelphia.

**TOWING MACHINES.**

American Ship Windlass Co.....Providence, R. I.  
 Chase Machine Co.....Cleveland.

**TOWING COMPANIES.**

Donnelly Salvage & Wrecking Co.....Kingston, Ont.  
 Great Lakes Towing Co.....Cleveland.  
 Midland Towing & Wrecking Co., Ltd.....Midland, Ont.

**TRAPS, STEAM.**

Kieley & Mueller .....New York.  
 Lunkenheimer Co.....Cincinnati.  
 Sturtevant Co., B. F.....Hyde Park, Mass.

**TRUCKS.**

Boston &amp; Lockport Block Co.....Boston.

**TUBING, SEAMLESS.**

Shelby Steel Tube Co.....Pittsburg, Pa.

## Buyers' Directory of the Marine Trade.—Continued.

## VALVES, STEAM SPECIALTIES, ETC.

American Steam Gauge & Valve Mfg. Co. Boston.  
Ashton Valve Co. Boston.  
Crane Co. Chicago.  
Jenkins Bros. New York.  
Kieley & Mueller New York.  
Lunkenheimer Co. Cincinnati.  
Ross Valve Co. Troy, N. Y.

## VALVES FOR WATER AND GAS.

Ross Valve Co. Troy, N. Y.

## VARNISHES.

Detroit Varnish Co. Detroit.  
Detroit White Lead Works. Detroit.  
Forest City Paint & Varnish Co. Cleveland.  
New Jersey Zinc Co. New York.  
Also Ship Chandlers.

## VENTILATING APPARATUS FOR SHIPS.

Sturtevant, B. F. Co. Hyde Park, Mass.

## VESSEL AND FREIGHT AGENTS.

Boland, John J. Buffalo.  
Brown & Co. Buffalo.  
Eppicke, C. W. & Co. Chicago.  
Fleming & Co., P. H. Chicago.  
Gilchrist & Co., C. P. Cleveland.  
Hall & Root Buffalo.  
Heim & Co., D. T. Duluth.

## VESSEL AND FREIGHT AGENTS—Con.

Hawgood & Co., W. A. Cleveland.  
Holmes, Samuel New York.  
Hutchinson & Co. Cleveland.  
Lester, S. S. Quebec, Can.  
McCarthy, T. R. Montreal.  
Mitchell & Co. Cleveland.  
Parker Bros. Co., Ltd. Detroit.  
Prindiville & Co. Chicago.  
Richardson, W. C. Cleveland.  
Sullivan, D. & Co. Chicago.

## WATER GAUGES.

Bonner & Co., Wm. T. Boston.  
Lunkenheimer Co. Cincinnati, O.

## WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co. Buffalo.  
DeGrauw, Aymar & Co. New York.  
Upson-Walton Co. Cleveland.

## WHISTLES, STEAM.

American Steam Gauge & Valve Mfg. Co. Boston.  
Ashton Valve Co. Boston.  
Lunkenheimer Co. Cincinnati.

## WINDLASSES.

American Ship Windlass Co., Providence, R. I.  
American Ship Building Co. Cleveland.  
Hyde Windlass Co. Bath, Me.  
Jenks Ship Building Co., Port Huron, Mich.  
Marine Mfg. & Supply Co. New York.

## WINCHES.

American Ship Windlass Co., Providence, R. I.  
Georgian Bay Engineering Works. Midland, Ont.  
Hyde Windlass Co. Bath, Me.

## WOOD WORKING MACHINERY.

Atlantic Works, Inc. Philadelphia.

## WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co. Kingston, Ont.  
Great Lakes Towing Co. Cleveland.  
Midland Towing & Wrecking Co., Ltd. Midland, Ont.  
Parker Bros. Co., Ltd. Detroit.

## YACHT AND BOAT BUILDERS.

Bertram Engine Works Co., Ltd., Toronto, Can.  
Drein, Thos. & Son. Wilmington, Del.  
Georgian Bay Engineering Works. Midland, Ont.  
Truscott Boat Mfg. Co. St. Joseph, Mich.  
Willard, Chas. P. & Co. Chicago.

## YAWLS.

Drein, Thos. & Son. Wilmington, Del.

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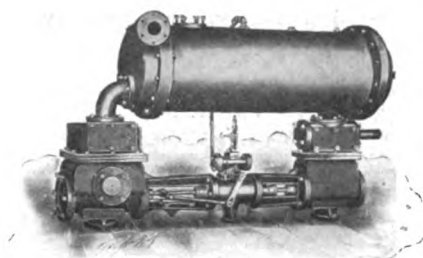
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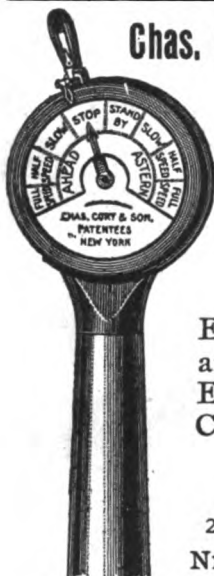
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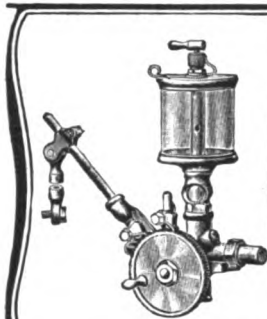
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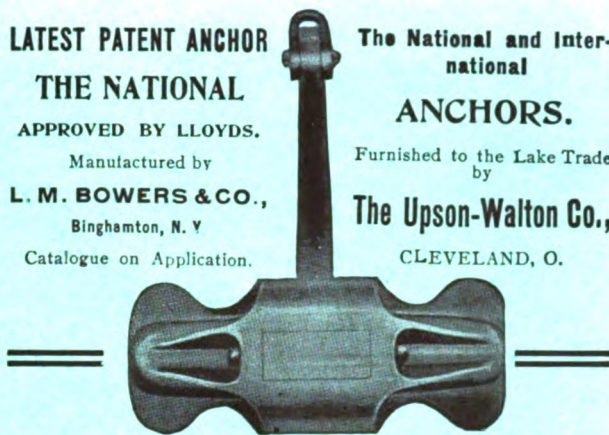
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No. 20, Chicago and Cleveland Exp.	*7:20 a.m.	.....
No. 28, New York and Boston Exp.	*7:40 a.m.	*8:00 a.m.
No. 40, Toledo and Buffalo Accom.	†10:00 a.m.	†0:30 a.m.
No. 32, Fast Mail	*11:25 a.m.	*11:30 a.m.
No. 48, Accommodation via Sandusky	†1:40 p.m.	.....
No. 42, Boston-New York Express	.....	*11:45 a.m.
No. 44, Cleveland and New York Spl	.....	*3:00 p.m.
No. 46, Southwestern Express	.....	*3:10 p.m.
No. 116, Ashtabula Accommodation	.....	†4:30 p.m.
No. 6, Limited Fast Mail	*5:40 p.m.	*5:45 p.m.
No. 26, 20th Century Limited	*7:40 p.m.	*7:43 p.m.
No. 10, Chicago, N.Y. & Boston Spl.	*7:30 p.m.	*7:50 p.m.
No. 16, New England Express	*10:30 p.m.	*10:35 p.m.
No. 2, Day Express	†9:10 p.m.	†9:25 p.m.
No. 126, Norwalk Accommodation	†7:55 a.m.	.....
Westward	Arrive from East	Depart West
No. 7, Exposition Limited	*12:50 a.m.	.....
No. 11, Southwestern Limited	*2:55 a.m.	.....
No. 9, Day Express	.....	†6:10 a.m.
No. 15, Boston and Chicago Special	*3:10 a.m.	*3:15 a.m.
No. 19, Lake Shore Limited	*7:15 a.m.	*7:25 a.m.
No. 23, Western Express	*10:30 a.m.	*10:35 a.m.
No. 29, Southwestern Special	†11:10 a.m.	.....
No. 33, Southwestern Express	*12:25 p.m.	.....
No. 133, Cleveland and Detroit Exp.	.....	*12:45 p.m.
No. 47, Accommodation	†11:00 a.m.	†3:00 p.m.
No. 141, Sandusky Accommodation	.....	†3:10 p.m.
No. 43, Fast Mail	*4:35 p.m.	*4:40 p.m.
No. 127, Norwalk Accommodation	.....	†5:10 p.m.
No. 37, Pacific Express	*6:50 p.m.	*7:20 p.m.
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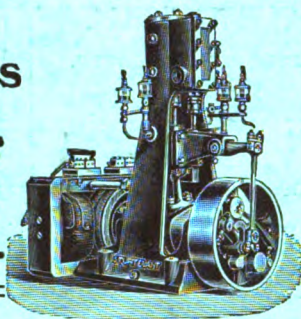


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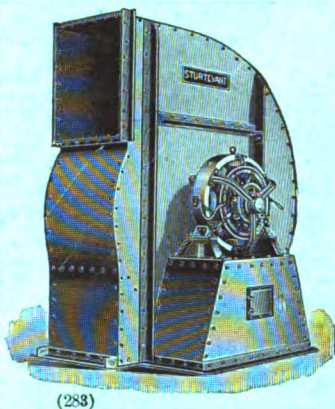
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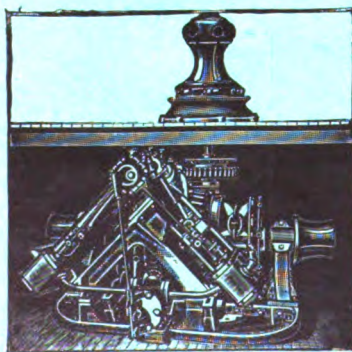
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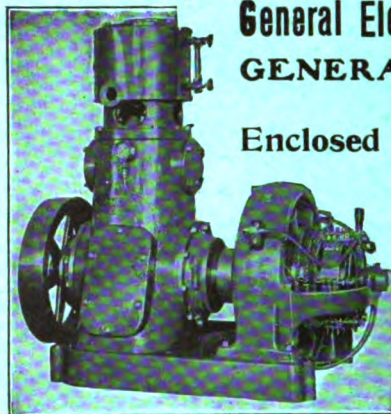
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